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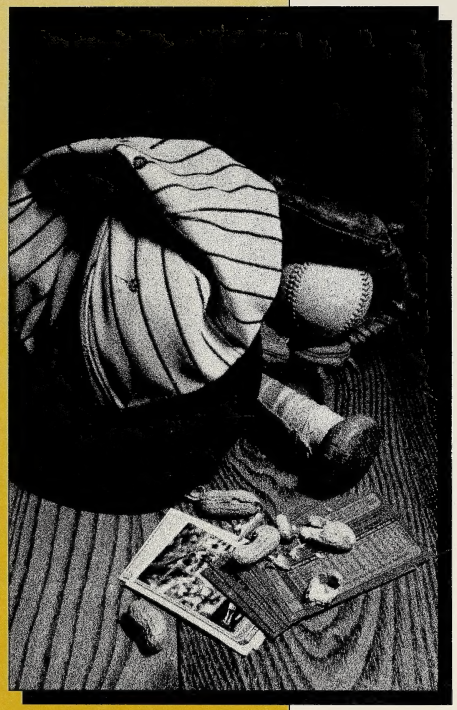

8

MODULE 7
DATA MANAGEMENT

Distance Learning

Alberta EDUCATION

LEARNING FACILITATOR'S MANUAL

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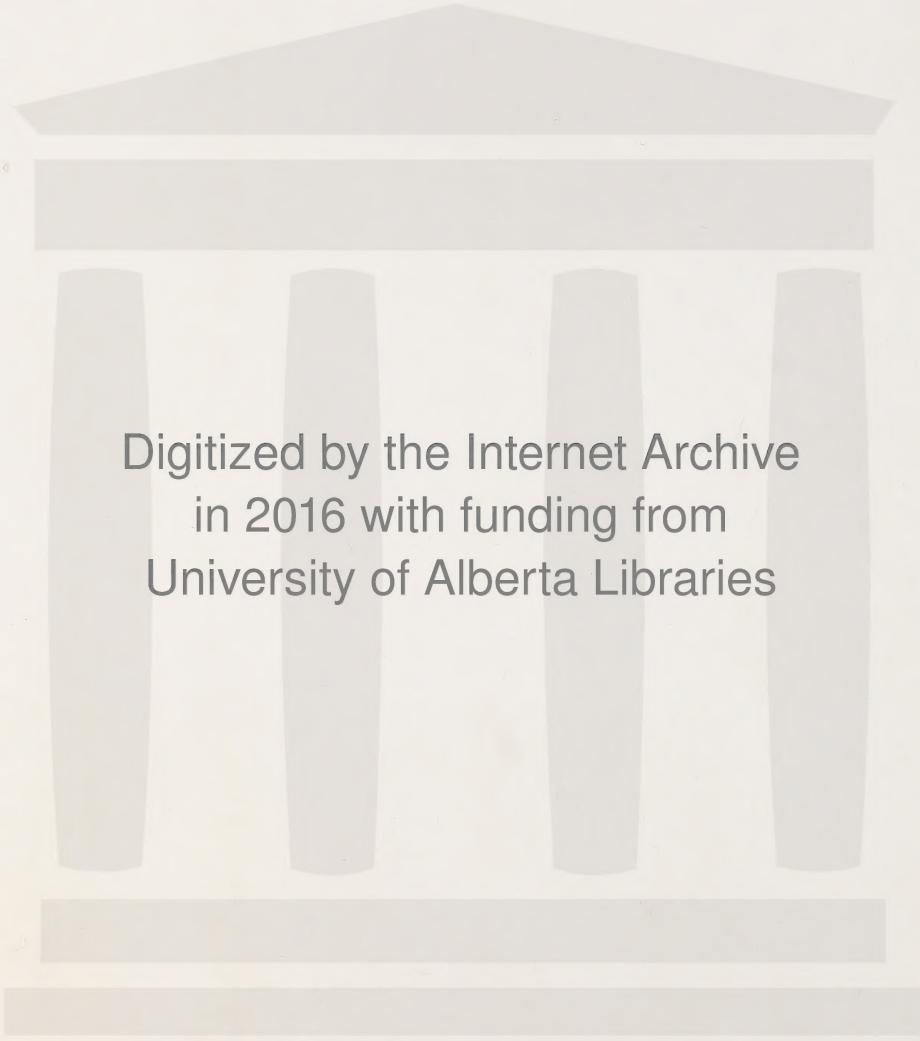
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Mathematics 8

Module 7: Data Management

LEARNING FACILITATOR'S MANUAL

Note

This Mathematics Learning Facilitator's Manual contains answers to teacher-assessed assignments and the final test; therefore, it should be kept secure by the teacher. Student's should not have access to these assignments or the final test until they are assigned in a supervised situation. The answers should be stored securely by the teacher at all times.

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Module 7
Data Management
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MODULE INTRODUCTION

What Lies Ahead

In this module introduction the student will learn the importance of learning about statistics. The student will also preview the components of the module.

Gathering Materials

For this section the student will need these items.

Mathematics 8
Module 7
Data Management

Guiding the Student

- Emphasize to the students that the goal of this module introduction is to preview the module.
- Discuss the learning process, time management, and evaluation with the students. See the suggestions on the next page of this booklet.

The Learning Process

Each section of Module 7 deals with a different skill involving data management.

Sections have several activities.

- Introductory Activities
- Practice Activities
- Extra Practice
- Concluding Activities

Remind the students that they will not be expected to do all the activities. You will help them decide what to do.

Time Management

Decide how long the students will need to complete the module. (The average student should spend about 3 weeks in a 40-week year to complete the module. It is recommended that students spend no more than 1 hour at a time doing mathematics.)

Evaluation

Explain to the students how the module will be evaluated.

GETTING SET

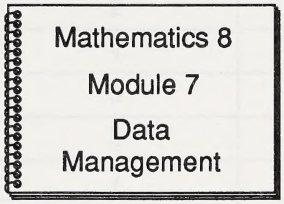
What Lies Ahead

In this section the student will test these skills.

- keeping tallies and making frequency tables
- constructing and interpreting pictographs, bar graphs, line graphs, and circle graphs
- recognizing misleading graphs
- distinguishing between a population and a sample
- recognizing a biased sample

Gathering Materials

For this section the student will needs these items.



geometry set

Guiding the Student

- Emphasize to the students that the goal of this section is to identify their strengths and weaknesses.
- Help the students check their answers to the pretest. It is not necessary to correct errors at this time. See the last page of this section for further directions.

Pretest

1. The students in Grade 7C were asked how many teeth fillings they had during their lifetimes.

They responded as follows:

3, 4, 5, 8, 2, 0, 6, 7, 4, 4,
8, 6, 1, 1, 4, 6, 3, 5, 7, 4,
1, 2, 3, 0, 0, 2, 5, 6, 2, 1,
0, 4, 3

Complete the following chart and find the frequency for each number of fillings.

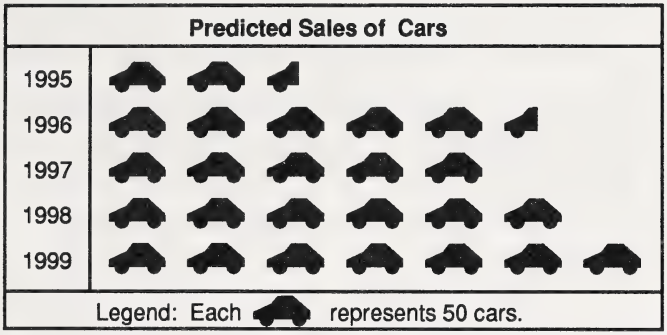
Number of Fillings	Tally	Frequency
0	||||	4
1		
2		
3		
4		
5		
6		
7		
8		

Suggested Answers

1.

Number of Fillings	Tally	Frequency
0	||||	4
1	||||	4
2	||||	4
3	||||	4
4	𝍸 |	6
5	|||	3
6	||||	4
7	||	2
8	||	2

2. Super Charge Vehicles Ltd. are predicting their sales of electric cars. The first automobile will be a 4-seater Hummalong. With its large battery, it is expected to go 250 km before the battery needs to be recharged. Recharging should only take $1\frac{1}{2}$ hours. The predicted sales are displayed in this graph. Study this graph. Then answer the following questions.



a. How many cars would be represented by ?

b. In which year should the production be over 300 vehicles?

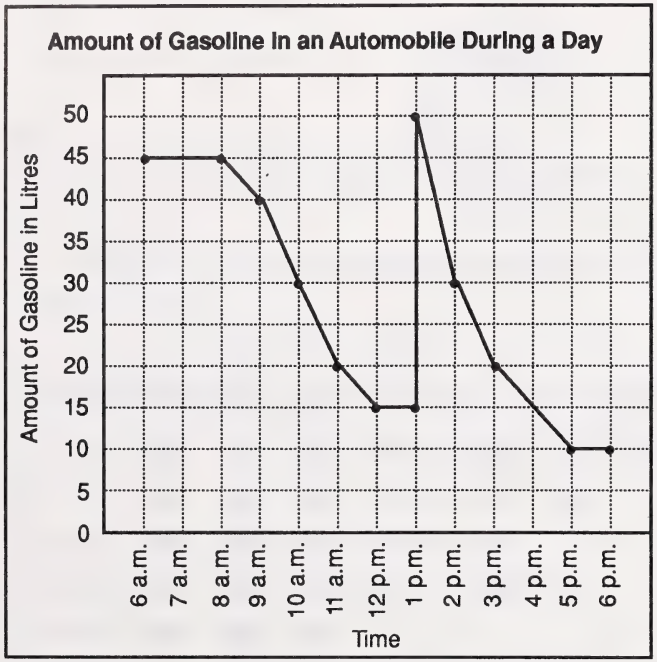
c. If each car sells for $16 000, how much does the company expect to earn in 1995?

2. a. 25 cars

b. 1999

c. $2 000 000

3. Study the graph below. Then answer the questions on the next page.



a. When did the driver of the car leave home?

b. When did the driver eat lunch?

c. When did the driver arrive home?

d. What do you think the driver does for a living? Why?

e. When did the driver fill up the gas tank?

f. How much gas did the driver purchase?

g. What is the capacity of the tank?

h. How much gas is left in the tank at 6 p.m.?

3. a. 8 a.m.

b. 12 p.m. - 1 p.m.

c. 5 p.m.

d. The driver is probably a taxi driver or salesperson. The driver is driving most of the day.

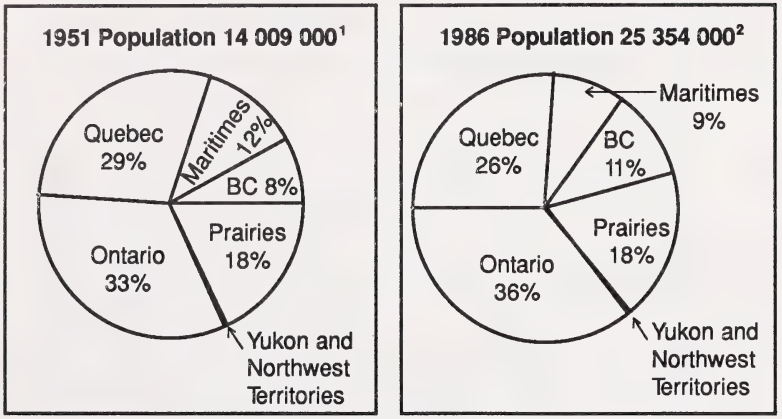
e. 1 p.m.

f. 35 L

g. 50 L

h. 10 L

4. Study these graphs. Then answer the questions on the next page.



Note

The Yukon and Northwest Territories are included as lines on these graphs because their combined population is less than 1% of the total population of Canada.

[1,2] Statistics Canada.

a. In what regions of the country did the percentage of population increase from 1951 to 1986?

b. What was the total population of Canada in the following years?

(i) 1951

(ii) 1986

c. Calculate the population of the Prairies in the following years.

(i) 1951

(ii) 1986

4. a. The population increased in British Columbia and in Ontario from 1951 to 1986.

b. (i) In 1951 the population of Canada was 14 009 000.

(ii) In 1986 the population of Canada was 25 354 000.

c. (i) 18% of 14 009 000

$= 0.18 \times 14\,009\,000$

$= 2\,521\,620$

In 1951 the population of the Prairies was 2 521 620.

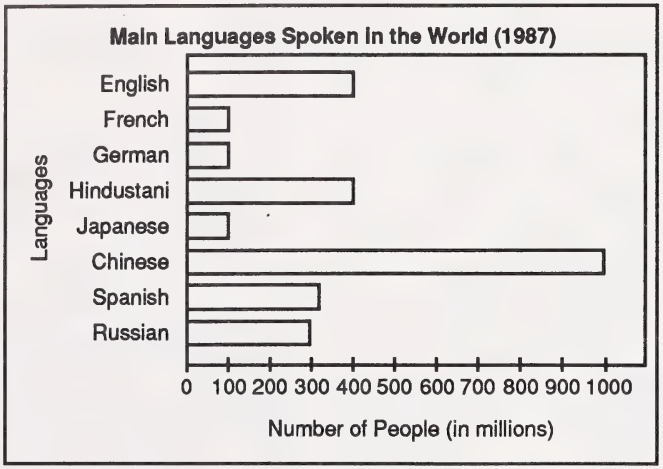
(ii) 18% of 25 354 000

$= 0.18 \times 25\,354\,000$

$= 4\,563\,720$

In 1986 the population of the Prairies was 4 563 720.

5. Study this graph. Then answer the following questions.



a. Which language is spoken by the greatest number of people?

b. About how many people speak English?

c. About how many people speak French?

5. a. Chinese

b. 400 000 000

c. 100 000 000

6. Make a pictograph to represent this data.[1]

Automobiles Registered in Canada in 1986	
Province	**Number**
Newfoundland	176 000
Nova Scotia	337 000
Prince Edward Island	56 000
New Brunswick	286 000
Quebec	2 614 000
Ontario	4 244 000
Manitoba	527 000
Saskatchewan	389 000
Alberta	1 296 000
British Columbia	1 527 000
Territories	25 000

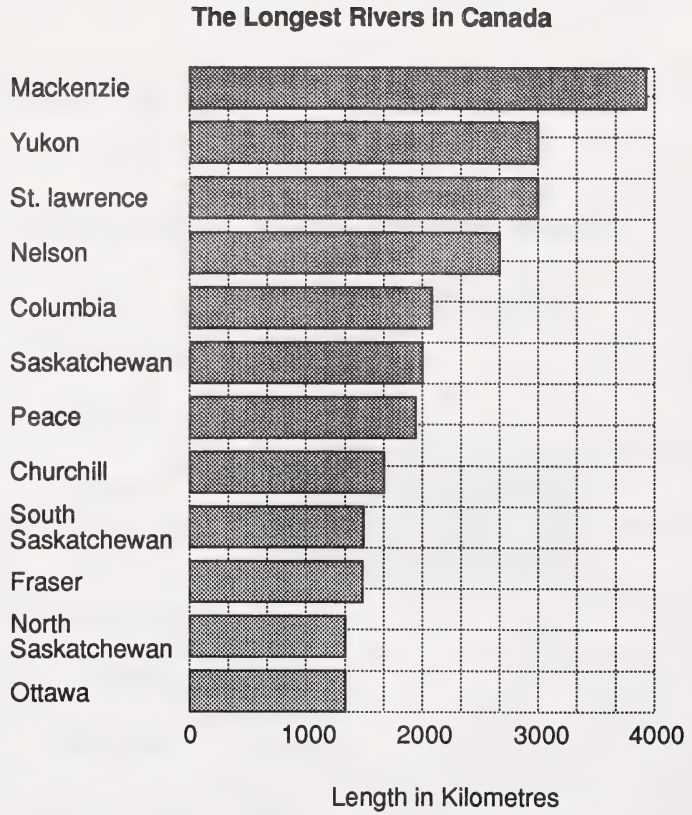
6.

Automobiles Registered in Canada in 1986	
Newfoundland	
Nova Scotia	
Prince Edward Island	
New Brunswick	
Quebec	
Ontario	
Manitoba	
Saskatchewan	
Alberta	
British Columbia	
Territories	
Legend: Each ◎ represents 100 000 automobiles.	

[1] Statistics Canada.

7. Make a bar graph to represent this data.[1]

The Longest Rivers in Canada	
River	**Length**
Mackenzie	4 241 km
Yukon	3 185 km
St. Lawrence	3 058 km
Nelson	2 575 km
Columbia	2 000 km
Saskatchewan	1 939 km
Peace	1 923 km
Churchill	1 609 km
South Saskatchewan	1 392 km
Fraser	1 370 km
North Saskatchewan	1 287 km
Ottawa	1 271 km



[1] Statistics Canada.

8. Teresa's parents kept a baby book and recorded her height at birth and on every birthday.

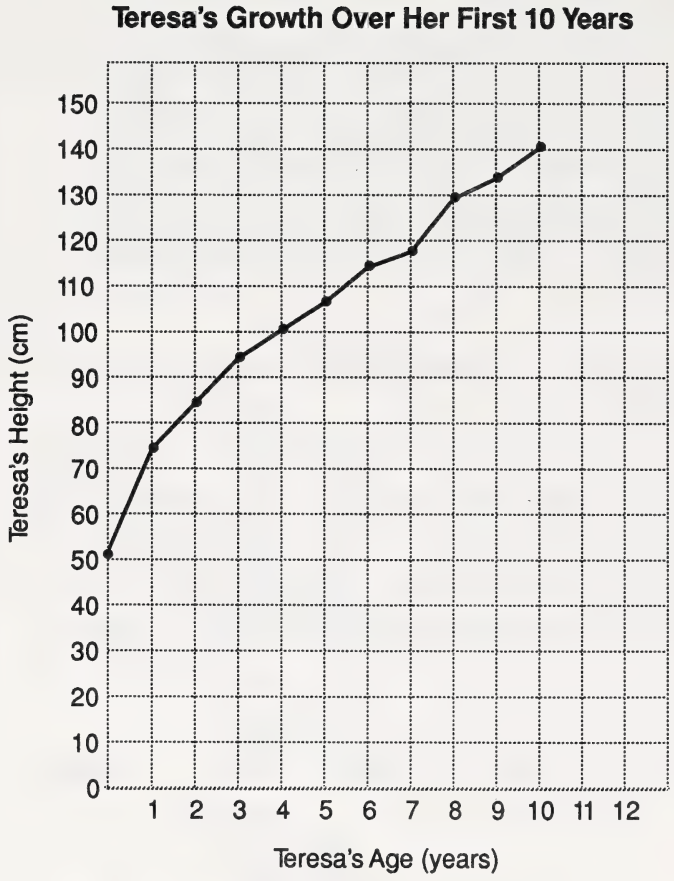
Theresa's Growth	
Age (a)	**Height (cm)**
birth	51
1	76
2	86
3	94
4	101
5	104
6	115
7	119
8	130
9	135
10	141

Make a line graph to display this data.

Note

The metric symbol for years is a.

8.



9. Make a circle graph to display this data.

Money Raised by Student Council	
Student Cards	$12 000
Canteen	$6 000
Dances	$2 000
Athletics	$10 000
Fund raiser	$10 000
Total	$40 000

9. Total 12 000 + 6 000 + 3 000 + 10 000 + 9 000
= 40 000

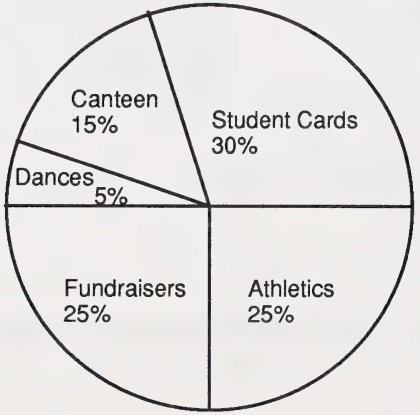
Student Cards 12 000 ÷ 40 000 = 0.3 = 30%
30% of 360°
= 0.3 × 360
= 108°

Canteen 6 000 ÷ 40 000 = 0.15 =15%
15% of 360°
= 0.15 × 360
= 54°

Dances 2 000 ÷ 40 000 = 0.05 = 5%
5% of 360°
= 0.05 × 360
= 18°

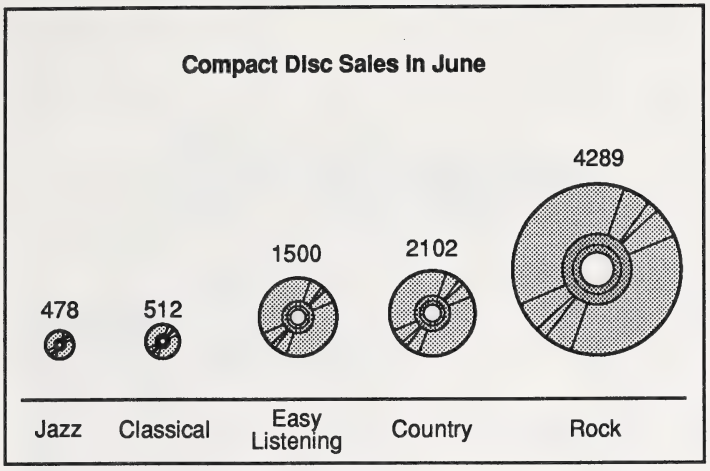
Fund Raisers/ Athletics 10 000 ÷ 40 000 = 0.25 = 25%
25% of 360°
= 0.25 × 360
= 90°

Student Council Income

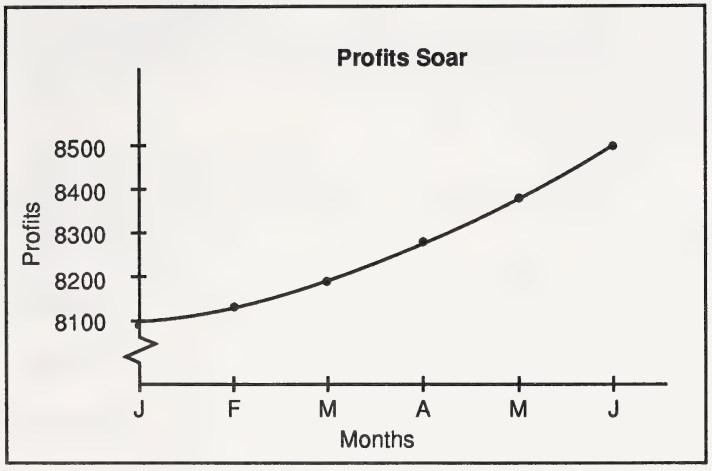


10. Explain why each of the following graphs is misleading.

a.



b.



10. a. Instead of using a picture of a disk to represent 500 sales, different-sized pictures are used. This is misleading. For example, about three times as many easy listening compact discs as jazz discs were sold in June. But the picture representing easy listening is three times as wide and three times as high as the picture representing jazz. The area of the easy listening picture has nine times the area as the jazz disc, so it is out of proportion.

b. Instead of letting each unit on the vertical scale represent $1 700, a broken scale is used. This broken scale causes the graph to have a steeper slope and give the appearance that profits are rising more quickly. This is misleading.

11. Define the following terms used in statistics.

    a. population

    b. census

    c. sample

    d. biased sample

    e. random sample

12. a. Yvonne wants to discover how many people in her town can swim. Explain how she could conduct a census to determine this.

    b. Explain how Yvonne could use sampling to estimate the number of people who can swim in her town.

11. a. A population is an entire set or group from which data is collected.

    b. A census is a count or measure of a property of a population.

    c. A sample is a part of a population.

    d. A biased sample is a sample that is not representative of a whole population.

    e. A random sample is a sample selected so that each member has an equal chance of being chosen.

12. a. Yvonne could visit every household in the town and question each family.

    b. Yvonne could get a list of the addresses of all the houses and apartments from the town office. Then she could select 10% in a random way. She could then visit these sample households and question each family.

13. Max wants to discover how far from school the students at his school live. Which sampling technique would produce more accurate results? Why?

    - Max asks every third student who gets off the school bus, "How far from school do you live?"

    - Max asks every fifth child entering the school, "How far from school do you live?"

13. The second technique is better. The first technique would not give a representative sample of the population. The children getting off the school bus probably live farther away.

14. There are 592 people who have library cards at Cumberland library. Rachel decides to mail a questionnaire to card holders to ask their opinion about purchasing more foreign language books. Which sampling technique would produce more accurate results? Why?

    - Mail questionnaires to five card holders whose names are selected at random from a list.
    - Mail questionnaires to 60 card holders whose names are selected at random from a list.

14. The second technique would produce more accurate results because about 10% of the population would be polled. The first technique uses too small a sample. The people polled may not be representative of the entire population.

Guiding the Student

Help each student to decide what to do next. It is recommended that students review the notes of the sections which corresponds to the questions with which the students experienced success, and that the students do a few sample questions from the activities.

It is recommended that students carefully study the notes in the sections which correspond to the questions with which the students experienced difficulty, and that the students do most of the questions in the activities.

Question	Skill	Section
1.	keeping tallies and making frequency tables	2
2.	interpreting pictographs	2
3.	interpreting line graphs	4
4.	interpreting circle graphs	5
5.	interpreting bar graphs	3
6.	making a pictograph	2
7.	making a bar graph	3
8.	making a line graph	4
9.	making a circle graph	5
10.	recognizing misleading graphs	6
11.	understanding terms	7
12.	distinguishing between a census and a sample	7
13., 14.	recognizing biased samples	7

PICTOGRAPHS

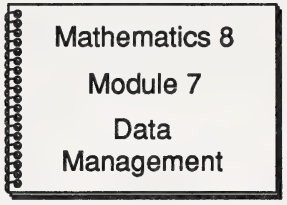
What Lies Ahead

In this section the student will learn these skills.

- interpreting pictographs
- constructing pictographs

Gathering Materials

For this section the student will need these items.



geometry set

Guiding the Student

- Emphasize to the students the goal of this section.
- Help the students decide what to do in this section.
- Help the students check their answers to the activities in this section and correct any errors.

Introductory Activities

1. Use the pictograph to answer the following questions.

Stanley Cup Winners (1959 - 1990)	
Montreal Canadiens	🏆🏆🏆🏆🏆🏆🏆🏆🏆🏆🏆🏆
Chicago Blackhawks	🏆
Toronto Maple Leafs	🏆🏆🏆🏆
Boston Bruins	🏆🏆
Philadelphia Flyers	🏆🏆
New York Islanders	🏆🏆🏆🏆
Edmonton Oilers	🏆🏆🏆🏆🏆
Calgary Flames	🏆
Legend: Each 🏆 represents 1 Stanley Cup.	

a. Which hockey team won the most Stanley Cups from 1959 - 1990?
b. How many Stanley Cups did the Edmonton Oilers win from 1959 - 1990?
c. How many Stanley Cups did the Calgary Flames win from 1959 - 1990?

Suggested Answers

1. a. Montreal Canadiens
   b. 5
   c. 1

2. Use this pictograph to answer the following questions.

Number of Passengers at Canada's Busiest Airports (1985)[1]	
Toronto	
Montreal (Dorval)	
Vancouver	
Calgary	
Winnipeg	
Legend: Each represents 100 000 passengers.	

a. Which airport was the busiest in Canada in 1985?

b. Did the Vancouver airport handle more passengers than the Montreal (Dorval) airport in 1985?

c. How many more passengers were handled in Vancouver than in Calgary in 1985?

2. a. Toronto

b. Yes

c. about 325 000 passengers

[1] Statistics Canada.

3. Use the pictograph to answer the questions on the next page.

Number of Cars Sold by Big City Auto Sales (1991)	
Jan.	
Feb.	
Mar.	
Apr.	
May	
June	
July	
Aug.	
Sept.	
Oct.	
Nov.	
Dec.	
Legend: Each represents 10 cars sold.	

a. How many cars were sold in these months?

(i) August, 1991

(ii) December, 1991

b. How many more cars were sold in June, 1991 than in January, 1991?

c. If each car was sold for $12 000, how much money was brought into the business in April, 1991?

d. Does this pictograph tell you clearly which were the best and worst months in 1991 for car sales?

3. a. (i) 75 cars

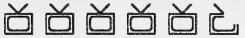
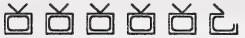
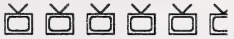
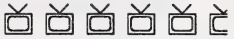
(ii) 20 cars

b. about 32 more cars

c. about $540 000

d. yes

4. Use the pictograph to answer the questions on the next page.

Longest-Running Canadian TV Shows (up to end of 1987-1988 season)[1]	
Hocket Night in Canada	
CFL Football	
Country Canada/Country Calendar	
Front Page Challenge	
The Nature of Things	
The Friendly Giant	
Hymn Sing	
The Tommy Hunter Show	
Wide World of Sports	
W-5	
Legend: Each represents 4 seasons.	

[1] Statistics Canada.

How many seasons had the following shows run up to the end of 1987-1988 season?

a. Hockey Night in Canada

b. Front Page Challenge

c. W-5

4. a. 36 seasons

b. 31 seasons

c. 22 seasons

Practice Activities

These were the top money-making films up to 1987.

Film	Total Rental
E.T. The Extra Terrestrial (1982)	$227 960 804
Star Wars (1977)	$193 500 000
Return of the Jedi (1983)	$168 002 414
The Empire Strikes Back (1980)	$141 600 000
Jaws (1975)	$129 961 081

Construct a pictogram to display this data. Use to represent $30 000 000.

Suggested Answers

Earnings of Films up to 1987	
E.T. The Extra Terrestrial	
Star Wars	
Return of the Jedi	
The Empire Strikes Back	
Jaws	
Legend: Each represents $30 000 000.	

BAR GRAPHS

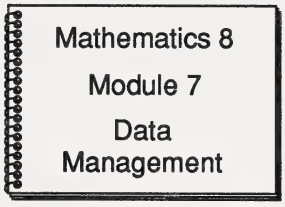
What Lies Ahead

In this section the student will learn these skills.

- interpreting bar graphs
- constructing a bar graph

Gathering Materials

For this section the student will need these items.

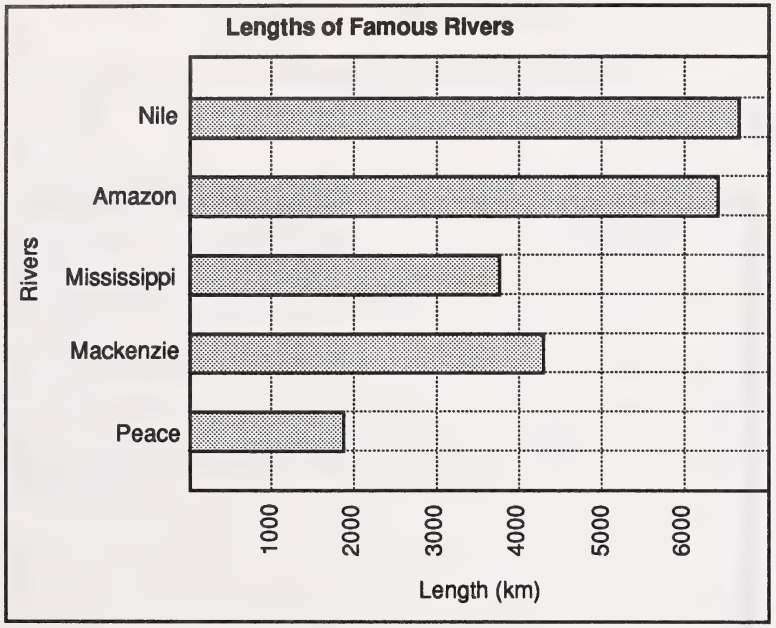


Guiding the Student

- Emphasize to the students the goal of this section.
- Help the students decide what to do in this section.
- Help the students check their answers to the activities in this section and correct any errors.

Introductory Activities

1. Use the bar graph to answer the following questions.



a. How long is the Amazon River?

b. How long is the Nile River?

c. How long is the Peace River?

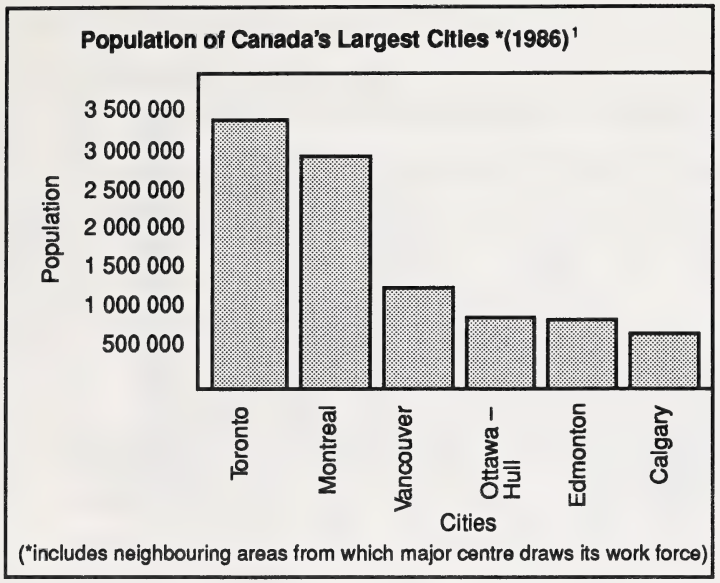
Suggested Answers

1. a. about 6 300 km

   b. about 6 500 km

   c. about 1 800 km

2. Use the graph to answer the following questions.



a. How many people lived in Calgary in 1986?

b. How many people lived in Montreal in 1986?

c. How many people lived in Vancouver in 1986?

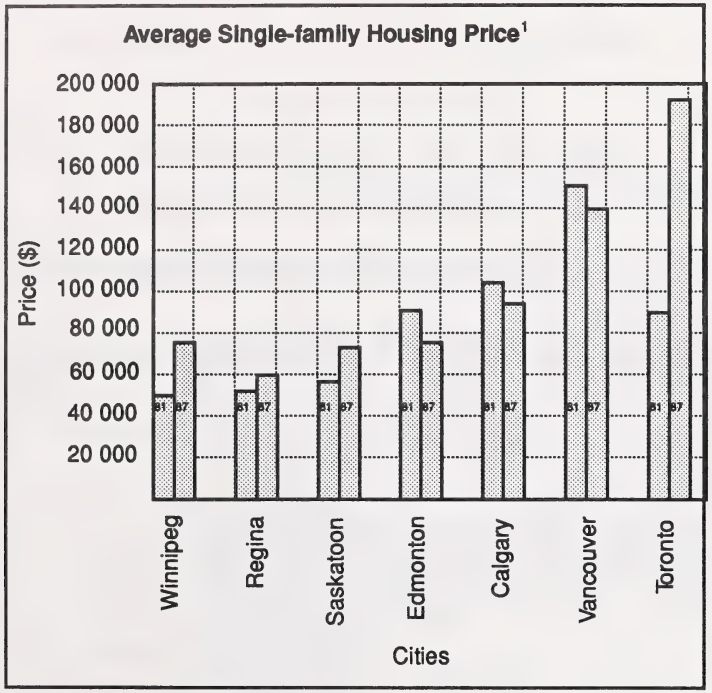
2. a. about 600 000 people

b. about 2 900 000 people

c. about 1 250 000 people

[1] Statistics Canada.

3. Use the graph to answer the following questions.



a. In which city did houses cost the most in 1981? In 1987?

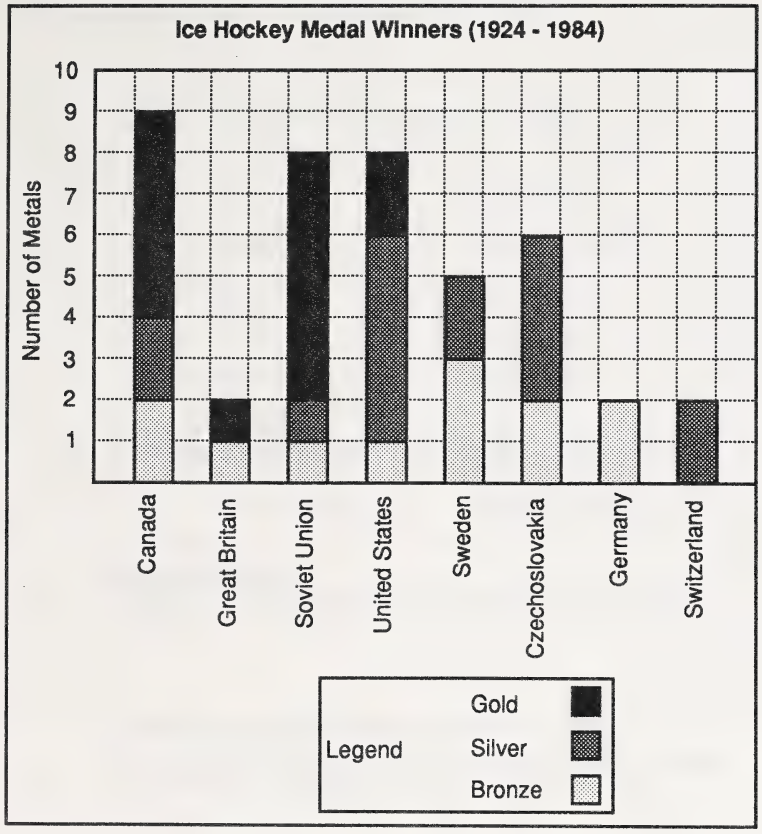
b. By how much did house prices increase in Vancouver between 1981 and 1987?

3. a. Vancouver in 1981, Toronto in 1987

b. about $100 000

[1] Statistics Canada.

4. Use the graph to answer the questions on the next page.



a. Which country won the most ice hockey medals from 1924 to 1984?

4. a. Canada

b. The Soviet Union and United States won the same number of ice hockey medals from 1924 to 1984. Which of these countries won the most gold medals?

b. The Soviet Union

c. Which countries have won gold medals in ice hockey during the period?

c. Canada, Great Britain, the Soviet Union, and the United States

d. How many gold medals in ice hockey did Canada win during the period?

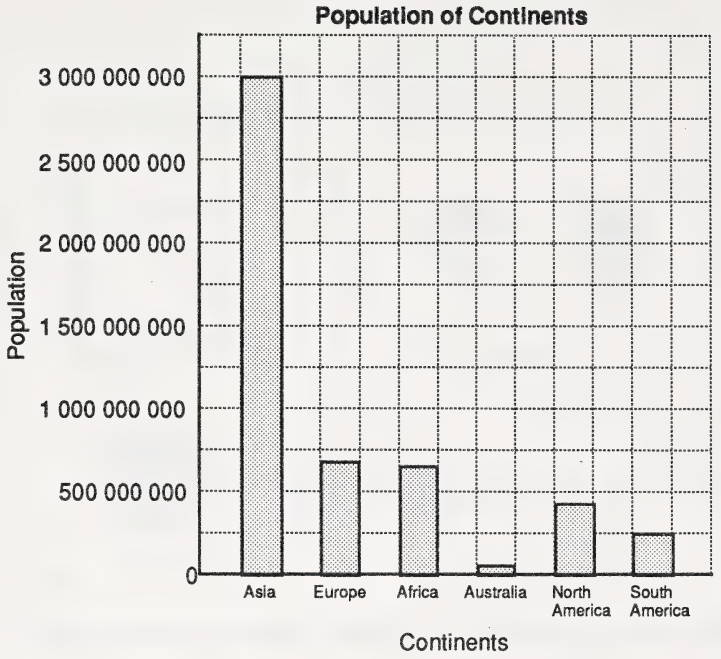
d. 5

Practice Activities

Construct a bar graph to display the following data.

Population by Continents (1988)	
Asia	3 031 100 000
Europe	684 800 000
Africa	615 300 000
Australia	25 500 000
North America	413 100 000
South America	282 200 000

Suggested Answers



LINE GRAPHS

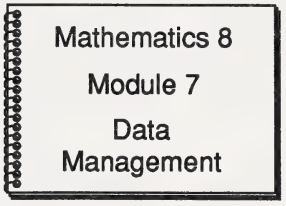
What Lies Ahead

In this section the student will learn these skills.

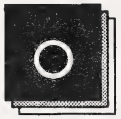
- interpreting a line graph
- drawing a line graph

Gathering Materials

For this section the student will need these items.



geometry set



(optional)

Pre-Algebra disk of Computer Drill and Instruction: Mathematics, Level D (SRA)

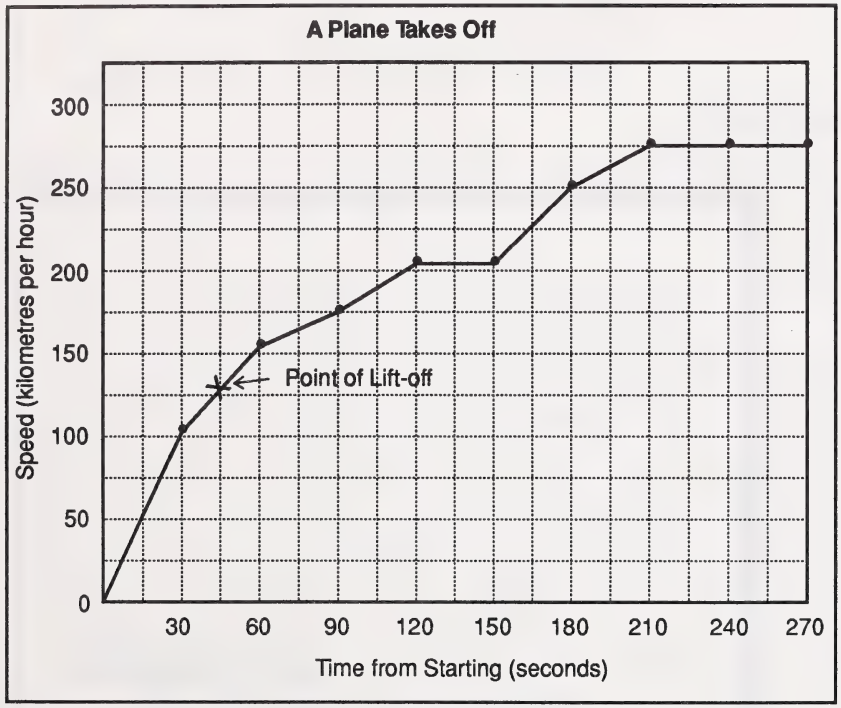
Guiding the Student

- Emphasize to the students the goal of this section.
- Help the students decide what to do in this section.
- Help the students check their answers to the activities in this section and correct any errors.

Introductory Activities

Suggested Answers

1. Use the graph to answer the questions on the following page.



a. When did the plane lift off?

b. How fast was the plane travelling when it lifted off?

c. Did it change its speed between 2 minutes and $2\frac{1}{2}$ minutes?

d. What was the highest speed attained by the aircraft?

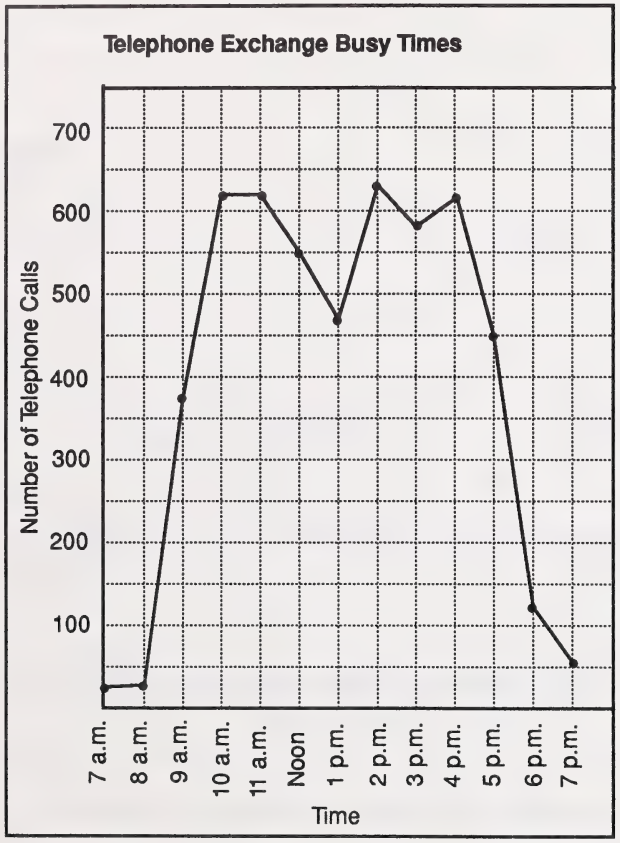
1. a. 45 seconds

b. 125 km/h

c. no

d. 275 km/h

2. Use the graph below to answer the following questions.



a. Between what hours were there more than 500 calls going through the exchange?

b. Try to explain why most calls are made between 9 a.m. and 5 p.m.

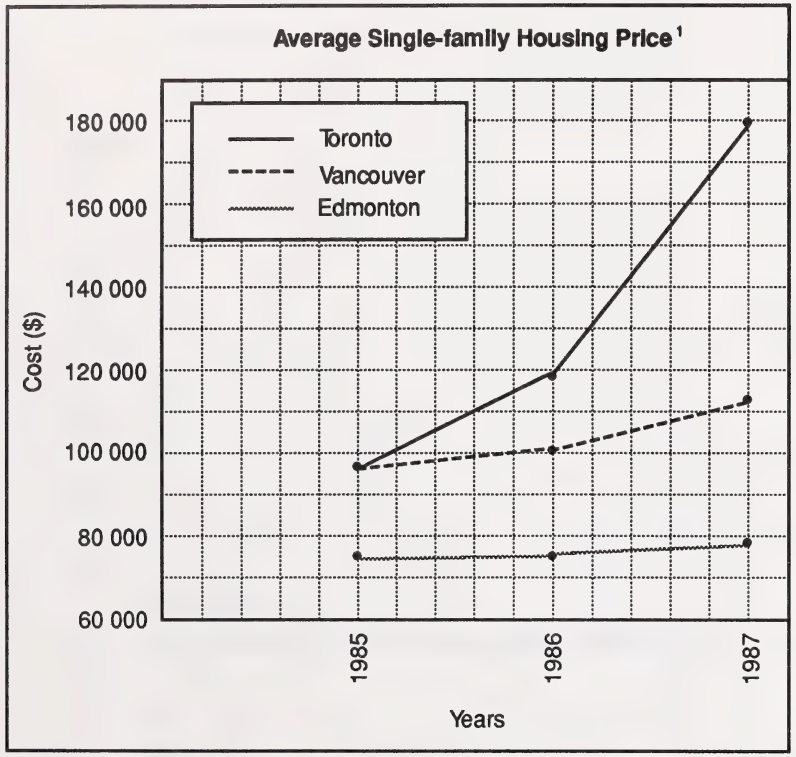
c. Why would there be a drop-off in calls between noon and 1:00 p.m.?

2. a. between 9:30 a.m. and 12:30 p.m., and between 1:15 p.m. and 4:45 p.m.

b. These are business hours.

c. This is noon hour.

3. Use the graph to answer the questions on the next page.



[1] Statistics Canada.

a. In which of these cities did the houses cost the most in 1987?

b. In which of these cities did the houses cost the least in 1987?

c. In which of these cities did the price of houses change the least from 1985 to 1987?

3. a. Toronto

b. Edmonton

c. Edmonton

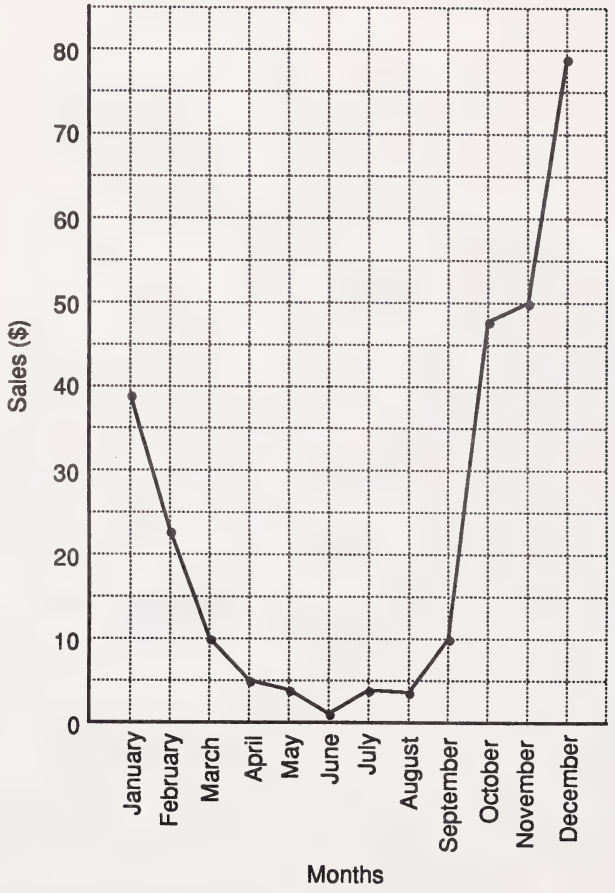
Practice Activities

1. Below is data from McCarthy's Sporting Goods Store. Construct a line graph to display the data.

Months	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Sales of Skis	39	23	10	5	4	2	4	4	10	48	50	77

Suggested Answers

1. **Sales of Skis at McCarthy's Sporting Goods Store**

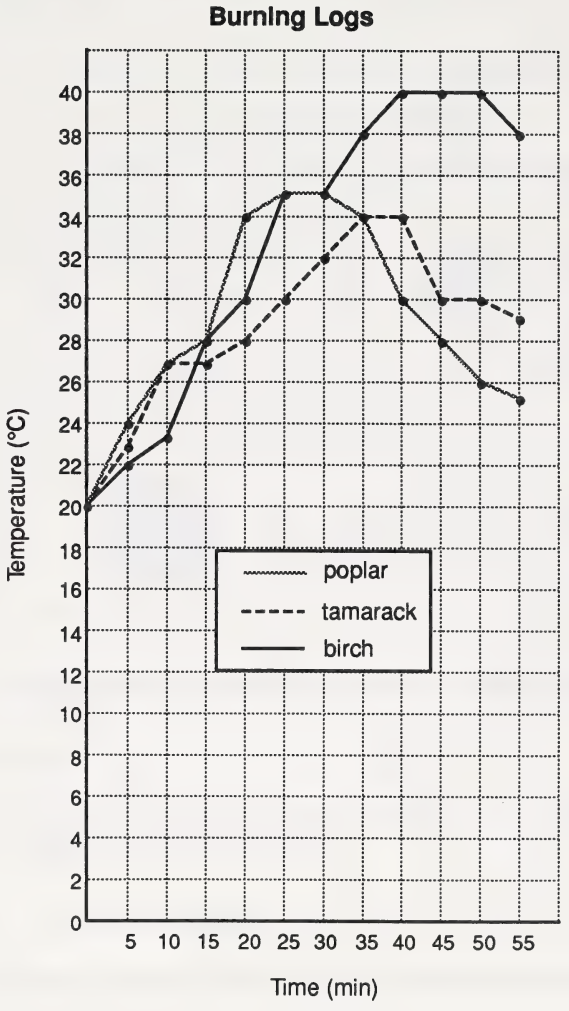


2. For a science fair Susan decided to see which kind of logs burned the hottest and longest. She burned three logs of the same weight. One log was poplar, one was tamarack, and one was birch. She placed a thermometer in front of the fireplace and took readings every 5 minutes. Here are the results.

POPLAR		TAMARACK		BIRCH	
Time	Temp.	Time	Temp.	Time	Temp.
0	20	0	20	0	20
5	24	5	23	5	22
10	27	10	27	10	27
15	28	15	27	15	28
20	34	20	28	20	30
25	35	25	30	25	35
30	35	30	32	30	35
35	34	35	34	35	38
40	30	40	34	40	40
45	28	45	30	45	40
50	26	50	30	50	40
55	25	55	27	55	38

Display this information on a line graph. Use different colours to represent the three kinds of wood.

2.



Computer Alternative

3. If you require further practice plotting a point, do Lessons 18 and 19 on the *Pre-Algebra disk of Computer Drill and Instruction: Mathematics, Level D* (SRA)

3. Computer corrected

CIRCLE GRAPHS

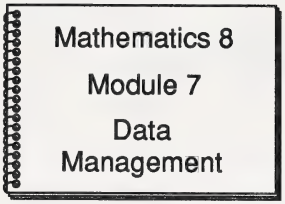
What Lies Ahead

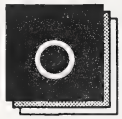
In this section the student will learn these skills.

- interpreting circle graphs
- drawing circle graphs

Gathering Materials

For this section the student will need these items.





(optional)

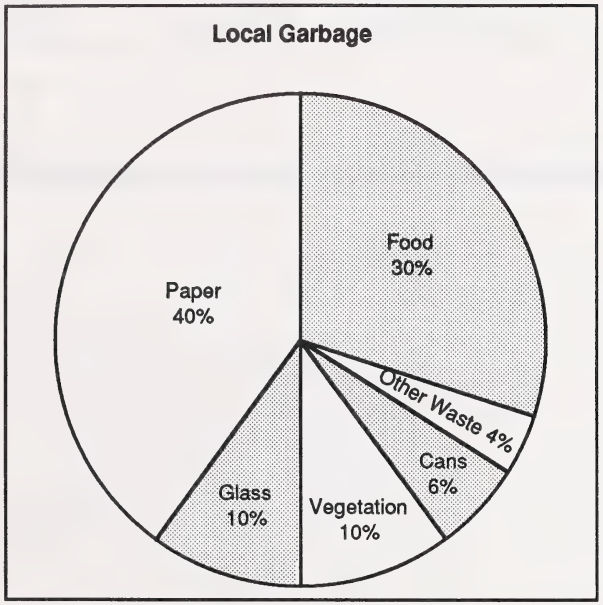
Pie Graphics on *Disk C* of *MAC 7*
(Houghton Mifflin)

Guiding the Student

- Emphasize to the students the goal of this section.
- Help the students decide what to do in this section.
- Help the students check their answers to the activities in this section and correct any errors.

Introductory Activities

1. Look at the circle graph and then answer the following questions.



a. Of which kind of garbage is there the most?

b. How many times as much paper is thrown out as vegetation?

Suggested Answers

1. a. paper

   b. four times

c. In 1t (1000 kg) of garbage, how many kilograms are there of each of the following types of garbage?

(i) glass

(ii) cans

(iii) paper

d. If people could reuse the paper, the glass, and the cans, how much out of every 1000 kg would have to be thrown away?

c. (i) 10% of 1 000
$= 0.1 \times 1\,000$
$= 100$

In 1t, there are 100 kg of glass.

(ii) 6% of 1 000
$= 0.06 \times 1\,000$
$= 60$

In 1t, there are 60 kg of cans.

(iii) 40% of 1 000
$= 0.4 \times 1\,000$
$= 400$

In 1t, there are 400 kg of paper.

d. $40 + 10 + 6 = 56$

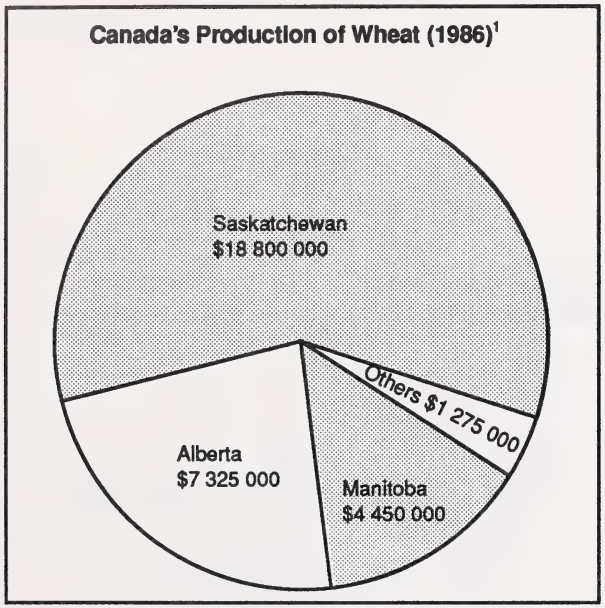
56% of 1 000
$= 0.56 \times 1\,000$
$= 560$

In 1t, 560 kg could be reused.

$1\,000 - 560 = 440$

In 1t, 440 kg would have to be thrown away.

2. Use the graph to answer the questions on the next page.



[1] Statistics Canada.

a. Which province produced the most wheat in 1986?

b. About what percent of the total production of wheat was produced in each province in 1986?

(i) Saskatchewan

(ii) Alberta

(iii) Manitoba

2. a. Saskatchewan

b. $18\,800\,000 + 1\,275\,000 + 4\,450\,000 + 7\,325\,000 = 31\,850\,000$

(i) $\frac{18\,800\,000}{31\,850\,000} = \frac{s}{100}$

$s \doteq 59$

About 59% was produced in Saskatchewan.

(ii) $\frac{7\,325\,000}{31\,850\,000} = \frac{a}{100}$

$a \doteq 23$

About 23% was produced in Alberta.

(iii) $\frac{4\,450\,000}{31\,850\,000} = \frac{m}{100}$

$m \doteq 14$

About 14% was produced in Manitoba.

Computer Alternative

3. For more practice estimating percents on a circle graph, do "Pie Graphics" on *Disk C of MAC 7* (Houghton Mifflin).

3. Computer corrected

Practice Activities

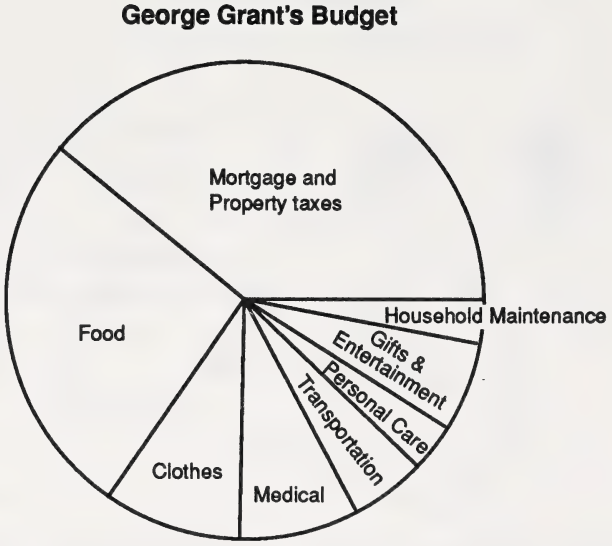
1. George Grant's net income each month is $2000. Here's how he budgets the money.

Expenses	Cost
Mortgage and property taxes	$780
Food	$540
Clothing	$180
Medical	$160
Transportation	$100
Personal care	$60
Gifts and entertainment	$120
Household maintenance	$60

Draw a circle graph to illustrate this data.

Suggested Answers

1.

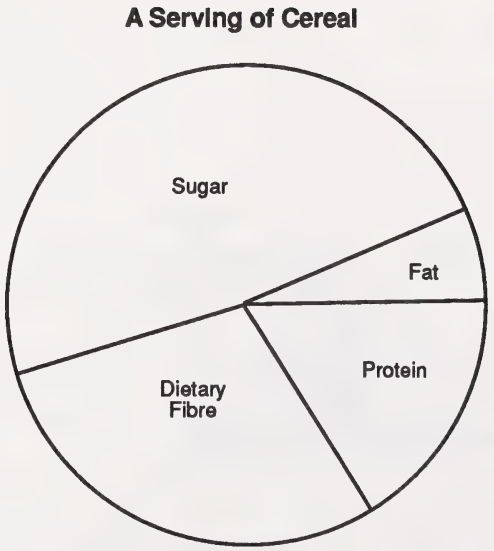


2. A package of cereal contains the following nutritional information.

Per Serving	
Nutrients	**Mass**
Protein	4.6 g
Fat	1.7 g
Sugar	13.5 g
Dietary Fibre	8.2 g

A serving is 28 g. Construct a circle graph to show the amount of each nutrient in a serving of the cereal.

2.



MISLEADING GRAPHS

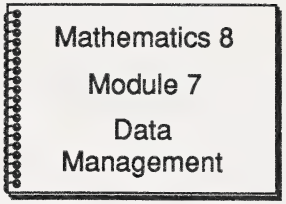
What Lies Ahead

In this section the student will learn these skills.

- recognizing graphs that are used to misrepresent data

Gathering Materials

For this section the student will need these items.



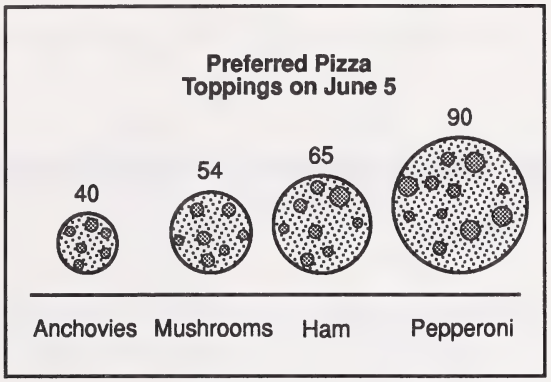
Guiding the Student

- Emphasize to the students the goal of this section.
- Help the students decide what to do in this section.
- Help the students check their answers to the activities in this section and correct any errors.

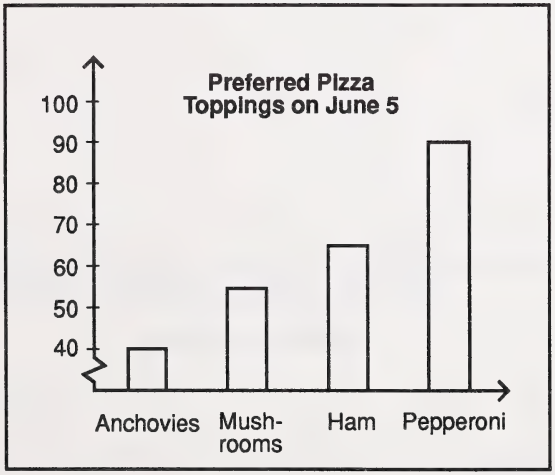
Practice Activities

1. Explain why the following graphs are misleading. Then redraw the graphs more realistically.

a.



b.



Suggested Answers

1. a. Instead of using a picture to represent 10 pizzas, different-sized pictures are used.

   The number of people who prefer pepperoni to the number of people who prefer anchovies is 2.25 to 1. However, the picture representing the people who prefer pepperoni is twice as wide and twice as high, so it appears much greater.

   b. Because the scale on the vertical axis is broken, the height of the bars are out of proportion.

   The pepperoni bar should be 2.5 times the anchovies bar. Instead it is 6 times higher.

2. Find examples of graphs that are misleading in newspapers and magazines. Explain why they are misleading.

2. Answers will vary.

DATA COLLECTION

What Lies Ahead

In this section the student will learn these skills.

- interpreting a population and census methods
- interpreting a sample and sampling methods
- estimating properties of a population from sample results

Gathering Materials

For this section the student will need these items.

Mathematics 8
Module 7
Data Management

(optional)

- *MATHWORKS: Sampling* (AIT)
- *SOLVE IT: Sampling* (AIT)

Guiding the Student

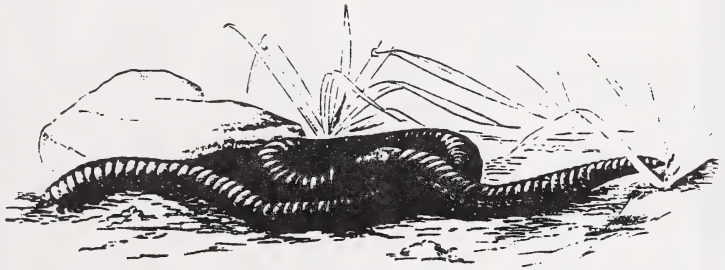
- Emphasize to the students the goal of this section.
- Help the students decide what to do in this section.
- Help the students check their answers to the activities in this section and correct any errors.

Introductory Activities

For each of the following, name the population and the property of the population that is being counted or measured. Then explain how a census could be conducted.

1. Mia wants to know how many of the children at the elementary school in her town come to school without eating breakfast.

2. Ralph wants to know how many earthworms there are in his garden.



Suggested Answers

1. The population is the children at the elementary school in Mia's town. The property being counted is the number of elementary children who come to school without eating breakfast.

   Answers will vary on how the census could be conducted, but the answers must state that all elementary children are counted. Interviews or questionnaires could be conducted.

2. The population is the earthworms in Ralph's garden. The property being counted is the number of earthworms. Answers will vary on how the census could be conducted. One way is to divide the garden into squares, dig up each square, and count the earthworms.

3. Research the census of Canadians that is held every five years.

   a. How is it conducted?

   b. How much money does a census cost?

   c. Why is the census necessary? What is done with the information obtained?

   d. Is the census 100% accurate? Why or why not?

3. a. Census takers drop off questionnaires at every household in Canada before census day. They return after census day and collect the questionnaires. The results are entered into computers.

   b. Answers will vary, depending on the year researched. In 1991 the census cost over $250 000 000.

   c. The figures are used to determine electoral boundaries, federal payments to the provinces, provincial payments to cities, and to formulate social and economic policies and in planning for schools, hospitals, and transportation systems.

   d. Although the census is quite accurate, it is not 100% accurate. Some households are missed and not all homeless people are counted.

Practice Activities

For each of the following, explain why the sample is biased.

1. Interviews were conducted with people randomly leaving or entering a swimming pool to determine how many people in the community can swim.

2. A questionnaire was handed out to students randomly selected from Hilcrest Junior High School to measure the popularity of a new video game among the teenagers in the community.

3. A telephone poll was conducted by telephoning people whose numbers were randomly chosen from the Calgary telephone book to determine the number of unemployed workers in Calgary.

Suggested Answers

1. The sample is biased because each person in the population does not have an equal chance of being chosen. People entering or leaving a swimming pool are probably swimmers.

2. The sample is biased because each person in the population does not have an equal chance of being chosen. Only students from one junior high school are questioned.

3. Not every person in Calgary has a telephone, so the sample is biased.

4. A newspaper printed a survey form and counted the responses that were returned to determine their readership's attitude to capital punishment.

5. The population of bighorn sheep in Alberta was estimated by dividing the province into sections of 1 km^2 and then randomly selecting 500 of these sections to form a sample.

6. At a dinner party the hostess asked every second guest at the table their preference of after-dinner activities.

4. When survey forms are returned voluntarily, the results are often biased. People who feel strongly on one side of the issue or another may reply, but others may not.

5. The bighorn sheep only lives in certain areas of the province. The sections drawn at random may not include any bighorn sheep. It would be preferable to divide the regions where the bighorn sheep live into regions and then take samples.

6. At dinner parties, people often sit in a male, female, male pattern. By asking every second person, only the men or only the women could be polled.

Concluding Activity

1. Sarah Wury picked 15 potatoes from 3 hills chosen at random on her farm. How many potatoes will there be in 60 hills.

2. Jackson randomly asks 2 people in a community of 832 if they can swim. He reports that 50% of the community can swim. Is this accurate? Why or why not?

Suggested Answers

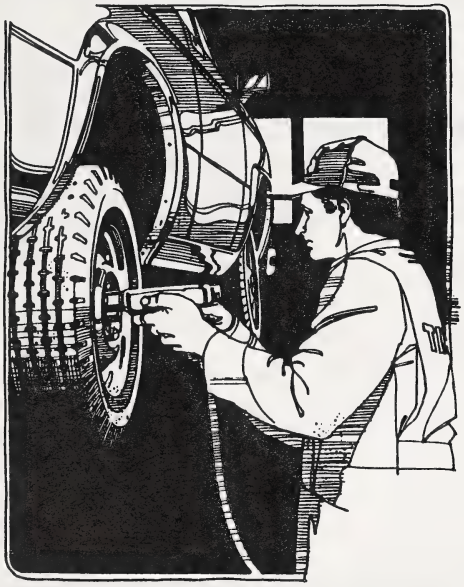
1. $\frac{15}{3} = \frac{x}{60}$

   $x = 300$

   There are probably 300 potatoes in the 60 hills.

2. No, the sample is too small to give accurate results.

3. Randy checks a random sample of 25 tires in every batch of 1000. If 2 tires in the sample are defective, how many in the batch are likely to be defective?



3. $\frac{2}{25} = \frac{x}{1000}$

$x = 80$

In the batch, 80 are likely to be defective.

SUMMARY

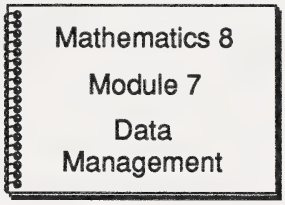
What Lies Ahead

In this section the student will review these skills.

- keeping tallies and making frequency tables
- constructing and interpreting pictographs, bar graphs, line graphs, and circle graphs
- recognizing misleading graphs
- distinguishing between a population and a sample
- recognizing a biased sample

Gathering Materials

For this section the student will need these items.



geometry set

Guiding the Student

- Emphasize to the students the goal of this section is to review the module.
- Help the students check their answers to the pretest in Section 1 and correct any errors.

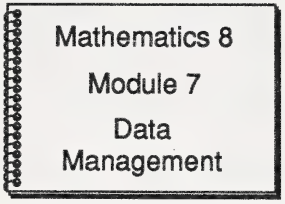
MODULE CONCLUSION

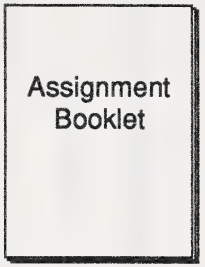
What Lies Ahead

In this section the student will complete the module assignment.

Gathering Materials

For this section the student will need these items.





geometry set

Guiding the Student

- Emphasize to students that they should do the assignment independently. They can, however, use reference materials.
- Give the students a grade and feedback to their assignment.

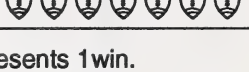
Suggested Answers to Assignment Booklet

Part 1: Multiple-Choice Questions

20

Each of the following questions has four suggested answers, one of which is better than the others. Place the letter of the best answer in the blank on the response page at the right.

Use the following pictograph to answer Questions 1 and 2.

Grey Cup Winners (1954-1990)	
B.C. Lions (W)	
Calgary Stampeders (W)	
Edmonton Eskimos (W)	
Hamilton Tiger Cats (E)	
Montreal Alouettes (E)	
Ottawa Rough Riders (E)	
Saskatchewan Roughriders (W)	
Toronto Argonauts (E)	
Winnipeg Blue Bombers (W)	
Legend : Each represents 1win.	

1. How many more times than the Saskatchewan Roughriders have the Winnipeg Blue Bombers won the Grey Cup from 1954 to 1990?

   A. 7
   B. 2
   C. 9
   D. 5

2. Altogether, how many times from 1954 to 1990 have western teams won the Grey Cup?

   A. 15
   B. 22
   C. 37
   D. 27

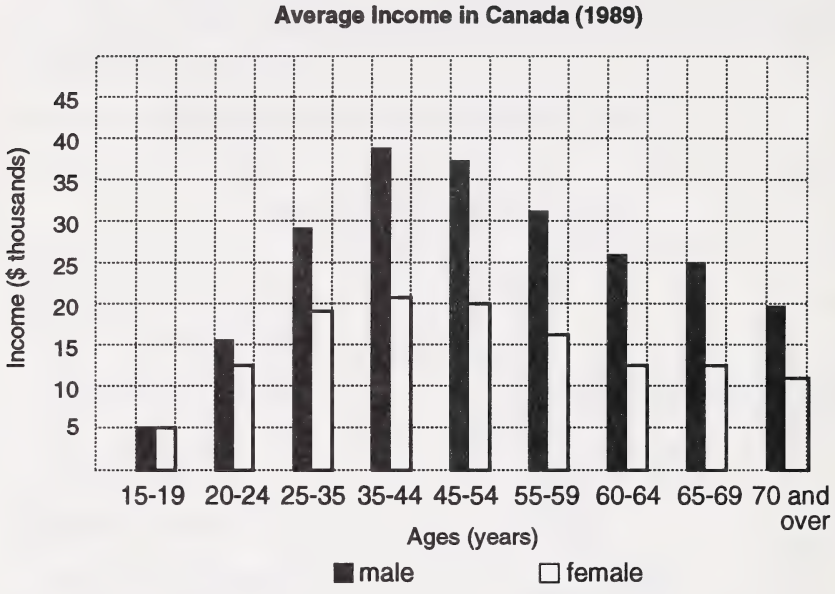
Part 1 Response Page

1. D

2. B

Part 1 (continued)

Use the following bar graph to answer Questions 3 and 4.



3. About how much more do males 35 to 44 years old earn than females of the same age?

   A. $38 000
   B. $21 000
   C. $59 000
   D. $17 000

4. What is the ratio of the income of males 15 to 19 years old to the income of males 20 to 24 years old?

   A. 2 : 1
   B. 3 : 1
   C. 4 : 1
   D. 6 : 1

Part 1 Response Page (continued)

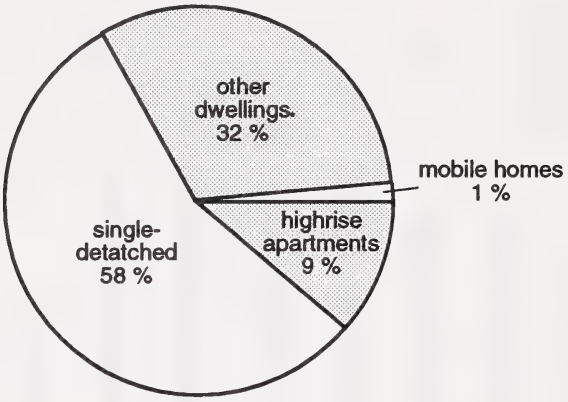
3. D

4. B

Part 1 (continued)

Use the following circle graph to answer Questions 5 and 6.

Type of Housing in Canada, 1986[1]



5. If there were about 9 000 000 dwellings in Canada in 1986, how many were highrise apartments?

   A. 8 100 000
   B. 810 000
   C. 81 000
   D. 8100

6. What percent of the housing are row houses, semi-detached houses, and apartments?

   A. 32%
   B. 33%
   C. 41%
   D. 42%

---

[1] Statistics Canada.
* Other dwellings include semi-detached houses, row houses, and apartments with less than 5 stories.

Part 1 Response Page (continued)

5. B

6. C

Part 1 (continued)

Use the following table to answer Questions 7 and 8.

Area of the Continents		
Continent	**Area** (rounded to nearest ten)	**% of Earth's Land** (rounded to nearest unit)
Asia	44 485 900 km^2	30%
Africa	30 269 680 km^2	21%
North America	24 235 280 km^2	16%
South America	17 820 770 km^2	12%
Europe	10 530 750 km^2	7%
Australia	7 682 300 km^2	5%
Antarctica	13 209 000 km^2	9%

7. If you were to construct a circle graph of the area of the continents, what angle measure would you use for the sector representing Asia?

   A. 30°
   B. 108°
   C. 45°
   D. 127°

8. If you were to construct a bar graph of the area of the continents, what would you let each unit of the axis representing the area be?

   A. 5000 km^2
   B. 50 000 km^2
   C. 500 000 km^2
   D. 5 000 000 km^2

Part 1 Response Page (continued)

7. B

8. D

Part 1 (continued)

9. If you were to construct a pictograph in which represents 1000 horses, what symbol represents 250 horses?

   A.

   B.

   C.

   D.

10. If you were to construct a pictograph in which represents 100 rabbits, how many symbols would you use to represent 250 rabbits?

    A. 2
    B. $2\frac{1}{2}$
    C. 3
    D. $3\frac{1}{2}$

Part 1 Response Page (continued)

9. B

10. B

Total for Part 1 = _____ (Maximum possible: 20 marks)

Part 2: Short-Answer Questions

50

Answer the following questions on the response page at the right.

1. For each of the following, name the population and the property of the population that is being counted or measured.

   a. Kyle wants to know what the most popular brand of 10-speed bicycle is in the city.

   b. Jordan wants to know the most popular political party in Alberta.

10

   c. Danielle wants to know how the members of a private club evaluate the facilities.

   d. Erin wants to know how many grizzly bears there are in Banff National Park.

   e. Kayla wants to know the concentration of chlorine in the local swimming pool.

Part 2 Response Page (continued)

1. a. The population is the people in the city. The property is the most popular brand of 10-speed bicycles.

   b. The population is the people in Alberta. The property is the most popular political party.

   c. The population is the members of a private club. The property is their opinion about the facilities.

   d. The population is the grizzly bears in Banff National Park. The property is how many grizzly bears there are.

   e. The population is the water in the swimming pool. The property is the concentration of chlorine.

Part 2 (continued)

6

2. For each of the following, explain why the statistics given by the organization are misleading.

   a. A local television station, after conducting a survey on the main street of Edmonton, stated that 70% of Albertans were in favour of raising the drinking age to 21.

   b. A razor manufacturer, after interviewing 5 people, advertised that 4 out of 5 people prefer their brand of razor.

   c. A local community arts council interviews a random sample of its membership and then reports that 85% of the community enjoys watching ballet.

4

3. A local stop-smoking group decides to take a survey to find out how many people living in the town smoke. Of 500 people interviewed, 80 are smokers. Estimate how many of the town's population of 10 000 are smokers.

Part 2 Response Page (continued)

2. a. The sample included only people from Edmonton, but conclusions were made from this sample about the opinions of all Albertans.

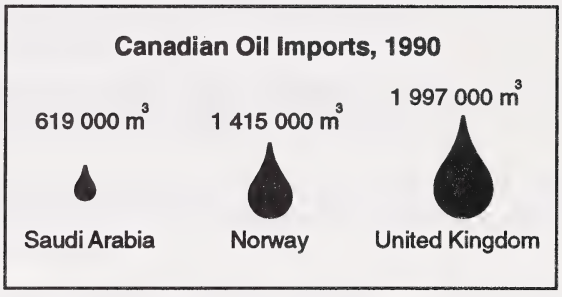
   b. The sample size was too small to make this claim.

   c. The sample was biased. Only the members of the community council were interviewed.

3. About 1600 of the people in the town are probably smokers.

Part 2 (continued)

10 4. The following graph shows the Canadian oil imports from three different countries in 1990.



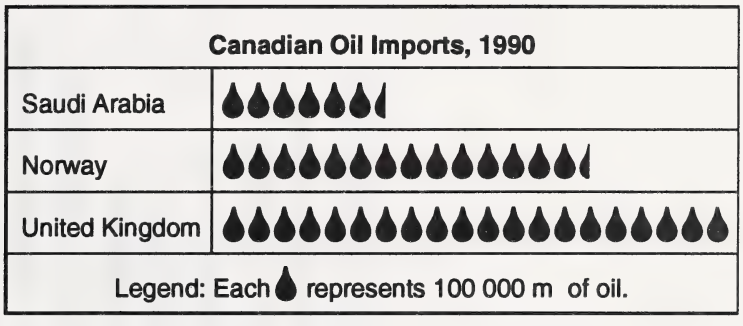
a. Explain why the graph is misleading.

b. Redraw the graph to display the information more honestly.

Part 2 Response Page (continued)

4. a. The graph is misleading because the areas of the symbols are not proportional to their values. The ratio of the imports from the United Kingdom to the imports from Saudi Arabia is about 3 to 1, but the ratio of the area of the symbols is about 9 to 1.

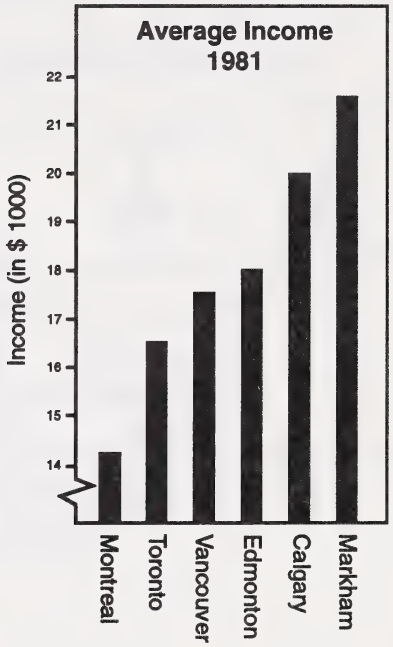
b.



Part 2 (continued)

10

5. The following graph shows the average income of citizens in six Canadian cities in 1981.



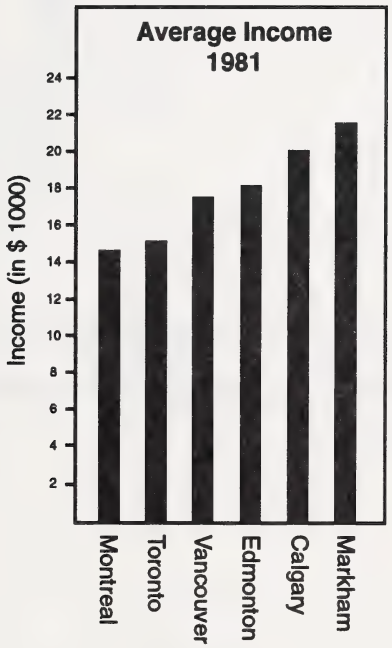
a. Explain why the graph is misleading.

b. Redraw the graph to display the information more honestly.

Part 2 Response Page (continued)

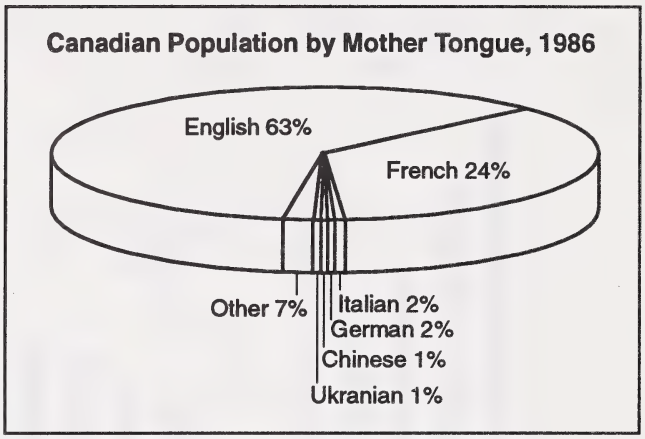
5. a. The vertical scale is broken. The areas of the bars are not proportional to their values.

b.



Part 2 (continued)

10 6. The following graph shows the mother tongue of the Canadian population in 1986.



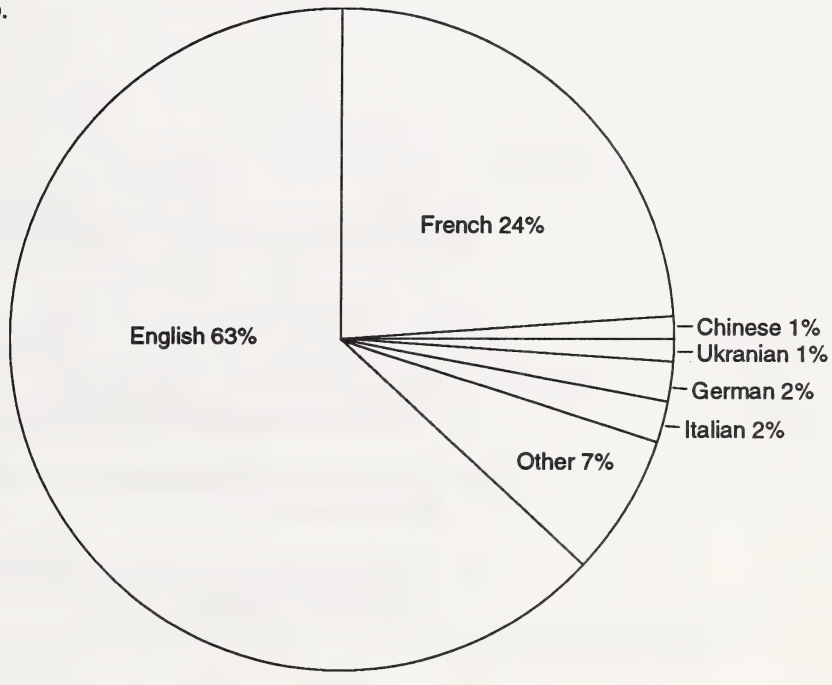
a. Explain why the graph is misleading.

b. Redraw the graph to display the information more honestly.

Part 2 Response Page (continued)

6. a. Because the circle is stylized and is shown three-dimensionally, the size of the sectors are not proportional to their values. About $\frac{1}{4}$ of the Canadian population had French as their mother in 1986, but the size of the sector does not show this. The sector representing French appears larger than $\frac{1}{4}$.

b.



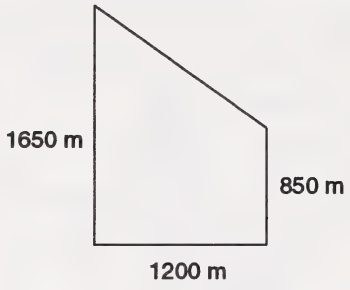
Total for Part 2 = _____ (Maximum possible: 50 marks)

Part 3: Problems

30

When answering the following questions, show all necessary work and give complete answers on the response page at the right.

1. A forester wants to know how many trees are in this wooded region.



She counts the trees in six 100-m^2 samples that have been randomly selected and discovers there are 255 trees in 600 m^2.

a. What is the area of the wooded region?

b. Estimate the total number of trees in the wooded region.

10

c. What is the average number of trees in 100 m^2 of the wooded region?

d. If 3 out of 5 trees are harvested, how many trees will there be in the sample areas?

e. If 3 out of 5 trees are harvested, how many trees will there be in the entire wooded region?

Part 3 Response Page

1. a. The area of the wooded region is 1 500 00 m^2.

   b. There are about 637 500 trees in the wooded region.

   c. There are about 42.5 trees in 100 m^2 of the wooded region.

   d. There will be about 102 trees in the sample areas.

   e. There will be about 600 000 trees in the entire wooded region.

Part 3 (Continued)

10

2. Fatima did a survey of the students in her school to discover which local radio stations were most popular.

Favorite Local Radio Stations

KGB	WHS	WBW	Other
𝍸	𝍸	𝍸	𝍸
𝍸	||	𝍸	|
|||		𝍸	
		𝍸	
		𝍸	
		𝍸	
		||||	

a. How many students were surveyed?

b. On the basis of the survey, predict how many of the 480 students in the school will like KGB.

c. Predict how many of the student body will not like WBW best.

d. Predict how many of the student body will like either KGB or WHS best.

e. If Fatima had asked one more student for an opinion, what would you guess the answer would be? Why?

Part 3 Response Page (continued)

2. a. 55 students were surveyed.

   b. About 113 students will prefer KGB.

   c. About 271 students will not like WBW best.

   d. About 367 students will like either KGB or WHS best.

   e. The student would probably prefer WBW because this was the first choice of the majority of students in the sample.

Part 3 (Continued)

10

3. A market analyst distributed 300 samples of Brand C orange juice in a one-week period at a local grocery store. Of the 300 people who sampled Brand C orange juice, 198 people liked the orange juice and said they would purchase it sometime in the future.

   The market analyst also collected information on the sales of Brand C orange juice and its two leading competitors for one week before and after the samples were distributed.

Weekly Sales of Orange Juice		
Orange Juice	**Before samples were distributed**	**After samples were distributed**
Brand A	288 L	182 L
Brand B	325 L	256 L
Brand C	112 L	317 L

   a. What percent of the people who sampled Brand C orange juice stated they liked it and would purchase it in the future.

   b. How many more sales of Brand C orange juice were there in the week after the samples were distributed than in the week before?

   c. What percent of the sales were actually Brand C in the week before the samples were distributed?

   d. What percent of the sales were actually Brand C in the week after the samples were distributed?

   e. By what percent did the sales of Brand C increase?

Part 3 Response Page (continued)

3. a. 66% of the people who sampled Brand C orange juice said they liked it and would purchase it in the future.

b. There were 205 more sales of Brand C in the week after the sampling than in the week before.

c. About 15% of the sales were Brand C in the week before the samples were distributed.

d. About 42% of the sales were Brand C in the week after the samples were distributed.

e. The sales of Brand C increased by 27%.

Total for Part 3 = _____ (Maximum possible: 30 marks)

Final Test

There are two copies of the final test: the teacher's copy which includes a marking guide, and the student's copy which is perforated and designed for photocopying and possible faxing.

Note:

The student's copy and the teacher's copy of this final test should be kept secure by the teacher.
Students should not have access to this test until it is assigned in a supervised situation.
The answers should be stored securely and retained by the teacher at all times.

MATHEMATICS 8

FINAL TEST

GENERAL INSTRUCTIONS

1. Time: **2 hours**
2. Total Marks: **100**
3. This test is to be completed independently under supervision without the use of any resource materials.
4. Before you begin to write this test, read through the entire test quickly so you know what you are required to do. You have two hours to complete the test, so distribute your time accordingly.
5. The Mathematics 8 test consists of three parts:

   Part 1 – Multiple-Choice Questions

   Part 2 – Short-Answer Questions

   Part 3 – Problems

   As you do the questions in Part 1, you must **not** use a calculator. As you do the questions in Part 2 and Part 3, you may use a calculator, but BE SURE TO SHOW ALL YOUR WORK. Answers alone are not enough to get full marks.

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Value

38

PART 1: MULTIPLE-CHOICE QUESTIONS

Suggested time: 25 minutes

Directions: Each of the following questions has four suggested answers, one of which is better than the others. Select the best answer, and indicate your choice by writing the letter in the blank on the response page at the right.

1. Which pair of numbers has 72 as the least common multiple?

   A. 24 and 36
   B. 6 and 24
   C. 9 and 12
   D. 24 and 16

2. Which pair of numbers has 6 as the greatest common factor?

   A. 16 and 60
   B. 24 and 36
   C. 18 and 24
   D. 21 and 30

3. Which is the greatest?

   A. 3^5
   B. 5^3
   C. 4^4
   D. 2^7

4. Which shows 2 500 000 expressed in scientific notation?

   A. 25×10^5
   B. 2.5×10^6
   C. 2.5×10^7
   D. 0.25×10^7

PART 1: RESPONSE PAGE

1. A
2. C
3. C
4. B

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Part 1 (continued)

5. Which is the additive inverse of $-2\frac{1}{3}$?

   A. $-\frac{3}{7}$

   B. $\frac{3}{7}$

   C. $\frac{7}{3}$

   D. $-\frac{7}{3}$

6. Which of these numbers is **not** a rational number?

   A. 0.38
   B. 0.333 333...
   C. 0.121 121 112...
   D. – 0.27

7. Which statement is true?

   A. $-\frac{5}{8} > -\frac{5}{11}$

   B. $\frac{1}{2} < -\frac{1}{3}$

   C. $\frac{9}{10} > -\frac{7}{10}$

   D. $\frac{2}{3} < \frac{5}{8}$

8. Which number is **not** equivalent to 325%?

   A. 0.325
   B. 3.25
   C. $\frac{325}{100}$
   D. $3\frac{1}{4}$

PART 1: RESPONSE PAGE (continued)

5. A

6. C

7. C

8. A

Part 1 (continued)

9. Which is the sum $\frac{1}{10} + \frac{3}{10}$ in lowest terms?

   A. $\frac{1}{5}$

   B. $\frac{2}{5}$

   C. $\frac{4}{10}$

   D. $\frac{4}{20}$

10. Which is the sum $(-8) + (-3)$?

    A. -11
    B. $+11$
    C. -5
    D. $+5$

11. Which is the difference $8 - 2\frac{3}{4}$?

    A. $10\frac{3}{4}$

    B. $6\frac{1}{4}$

    C. $5\frac{1}{4}$

    D. $6\frac{3}{4}$

12. Which is the difference $(-2) - (-8)$?

    A. -6
    B. $+6$
    C. -10
    D. $+10$

PART 1: RESPONSE PAGE (continued)

9. B

10. A

11. C

12. B

TEACHER'S COPY

Part 1 (continued)

13. Which is the product $\frac{1}{2} \times \frac{4}{5}$ in lowest terms?

A. $\frac{5}{7}$

B. $1\frac{3}{10}$

C. $\frac{2}{5}$

D. $2\frac{1}{2}$

14. Which is the product $(-2) \times (-8)$?

A. -10
B. $+10$
C. -16
D. $+16$

15. Which is the quotient $\frac{15}{16} \div \frac{5}{8}$ in lowest terms?

A. $1\frac{1}{2}$

B. $\frac{75}{128}$

C. $1\frac{1}{4}$

D. $\frac{5}{6}$

16. Which expression shows 3 more than 5 times a number?

A. $3 + 5n$
B. $n + 3 \times 5$
C. $3n + 5$
D. $3 \times 5 + n$

17. Which equation shows 5 less than a number is 8?

A. $5 < n + 8$
B. $5 - n = 8$
C. $5 < 8$
D. $n - 5 = 8$

PART 1: RESPONSE PAGE (continued)

13. C

14. D

15. A

16. A

17. D

Part 1 (continued)

18. What is the missing number?

n	▒ $n + 6$
1	8
2	10
3	12
4	14

A. 1
B. 2
C. 3
D. 4

19. What ordered pair solves the equation $y = 3x + 1$?

A. (1, 0)
B. (4, 1)
C. (1, 4)
D. (0, 1)

PART 1: RESPONSE PAGE (continued)

18. B

19. C

Value

PART 2: SHORT-ANSWER QUESTIONS

Suggested time: 15 minutes

Directions: When answering the following questions, show all necessary work and give complete answers on the response page at the right.

8

1. Solve each of the following equations using additive inverses and/or multiplicative inverses.

   a. $x + 16 = 20$

   b. $5n = 35$

   c. $8t - 2t = 36$

   d. $14 + 4x = 66$

PART 2: RESPONSE PAGE

1. a. $x = 4$

b. $n = 7$

c. $t = 6$

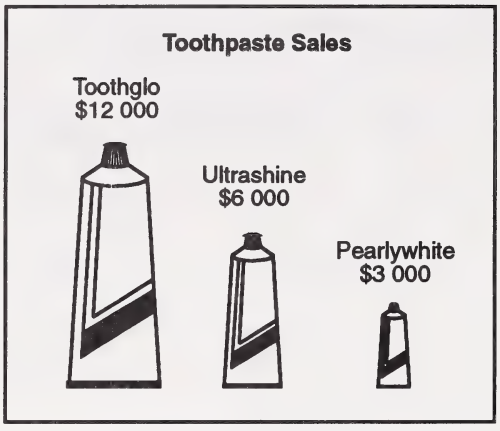
d. $x = 13$

Part 2 (continued)

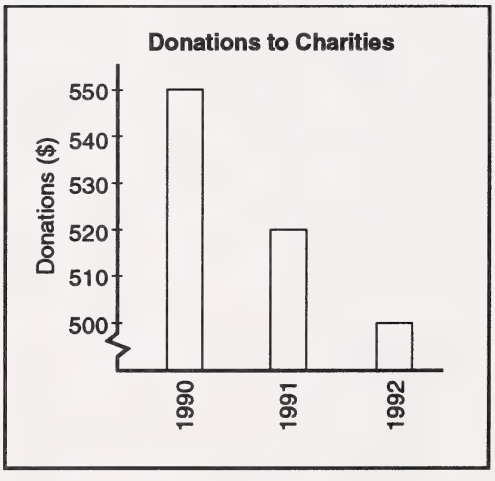
4

2. Why are the following graphs misleading?

a.



b.



PART 2: RESPONSE PAGE (continued)

2. a. The size of the toothpaste tubes are not proportional to the value of the sales. Toothglo is about 16 times as big as Pearlywhite, but the sales of Toothglo is only 4 times the sales of Pearlywhite.

   b. The vertical scale is broken, so the area of the bars are not proportional to their values. In 1992, $30 less was contributed to charities than in 1990, but the area of the bar for 1992 is only $\frac{1}{6}$ of the area of the bar from 1990.

Value

PART 3: PROBLEMS

Suggested Time: 80 minutes

Directions: When answering the following questions, show all necessary work and give complete answers on the response page at the right.

2 1. Crystal swam $5\frac{1}{3}$ lengths of the pool. If she did the crawl for $\frac{3}{4}$ of the time, how many lengths did she do the crawl?

2 2. Each plastic flight on a dart is in the shape of a parallelogram. The base of one flight is 3.2 cm and its height is 1.7 cm. Find the area of the flight.

2 3. A football team makes a gain of 5 yards, 12 yards, and 3 yards. It suffers losses of 10 yards and 4 yards. What is the total gain or loss in yards for the team?

2 4. On a hot day, an apple tree may lose 4.5 L of water per minute. Calculate the amount of water loss in one hour on a hot day.

2 5. The largest indoor rink is a rectangle that measures 75.2 m by 107.3 m. What is its area?

2 6. Chan knits one row of her scarf in $\frac{1}{20}$ h. How many rows can she knit in $\frac{3}{4}$ h?

PART 3: RESPONSE PAGE (continued)

1. Crystal did the crawl for 4 lengths.

2. The area of a flight is 5.44 cm^2.

3. The total gain for the team is 6 yards.

4. The amount of loss in one hour is 270 L.

5. The area of the rink is 8069.0 m^2.

6. Chan can knit 15 rows in $\frac{3}{4}$ h.

Part 3 (continued)

2 7. A jacket regularly priced at $90 is on sale. If the discount is 25%, what is the sale price?

2 8. A discus has a radius of 11 cm. What is the area of the discus?

2 9. On Saturday it snowed for $3\frac{1}{2}$ h. On Sunday it snowed for $1\frac{3}{4}$ h. How much longer did it snow on Saturday than on Sunday?

2 10. The temperature in Claresholm was – 8° C in the morning. By noon the temperature rose to 7° C. What was the change in temperature?

2 11. The dorsal fin of a shark is shaped like a triangle. It is 15.4 cm wide at the base and 22.3 cm high. Find the area of the dorsal fin.

2 12. Samir used $2\frac{1}{8}$ cans of paint. Fatima used $1\frac{3}{4}$ cans of paint. How many cans did they use altogether?

2 13. There are about 750 million people in China. The most common family name in China is Chang. People with a family name of Chang make up about 10% of the Chinese population. How many people in China have the family name Chang?

PART 3: RESPONSE PAGE (continued)

7. The sale price is $67.50.

8. The area of the discus is about 379.94 cm^2.

9. It snowed for $1\frac{3}{4}$ h longer.

10. The temperature change was + 15°C.

11. The area of the dorsal fin is 171.71 cm^2.

12. They use $3\frac{7}{8}$ cans of paint altogether.

13. About 75 million people in China have a family name of Chang.

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Part 3 (continued)

2 14. A rectangular block of wood has dimensions of 12 m by 1.25 m by 0.75 m. Calculate the volume of the wood.

2 15. In a survey 32 students out of 100 preferred country and western music. Estimate how many students in the student body of 372 prefer country and western music.

4 16. Dave shares a package of candies with Patty, Lori, and Suzanne. He gives $\frac{1}{5}$ of the candies to Patty. He then gives $\frac{1}{4}$ of the remaining candies to Lori. Next, he gives $\frac{1}{3}$ of the remaining candies to Suzanne. He keeps the rest of the candies for himself.

a. What fraction of the candies does each person have?

b. Who has the most candies?

4 17. Krish and Jean share the profits from their yard sale. The ratio of Krish's profits to Jean's profits is 5 to 3. If there is $160 in profits, how much does Krish make?

4 18. A goat is tied with a rope in one corner of a fenced field. The field is a square and the rope has the same length as one side of the field. If the perimeter of the field is 140 m, what is the area of the part of the field in which the goat can graze?

PART 3: RESPONSE PAGE (continued)

14. The volume of the wood is 11.25 m^3.

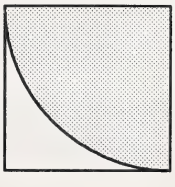
15. About 119 students will likely prefer country and western music.

16. a. Patty, Lori, and Suzanne each receive of the candies. Dave keeps $\frac{2}{5}$ of the candies.

    b. Dave has the most.

17. Krish makes $100.

18. The goat can graze on about 961.6 m^2.



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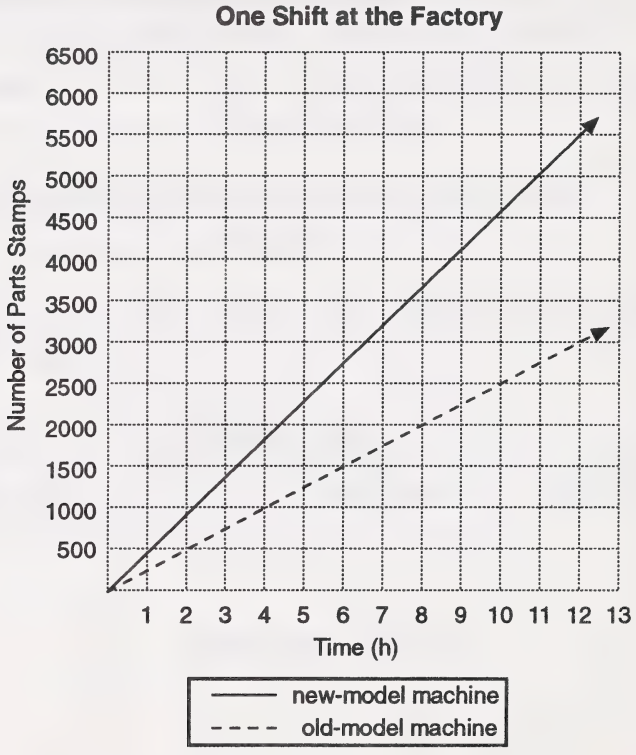
Part 3 (continued)

4

19. There are less than a dozen round tables at a banquet. The round tables are two sizes. One size seats exactly 5 people and the other size seats exactly 8 people. If there are 79 people seated at the round tables and there are no empty places, how many tables of each size are there?

4

20. A factory has two models of machines to stamp parts. This graph shows how many parts each machine can stamp in one 12-h shift.



a. How many parts can the old-model machine stamp in 12 h?

b. How many parts can the new-model machine stamp in 12 h?

c. How many parts can the old-model and the new-model machines stamp together in 12 h?

d. How long did it take the new-model machine and the old-model machine to stamp 1500 parts altogether?

TEACHER'S COPY

PART 3: RESPONSE PAGE (continued)

19. These are possible answers.

    There could be 3 tables that seat 5 people and 8 tables that seat 8 people.

    There could be 11 tables that seat 5 people and 3 tables that seat 8 people.

20. a. The old-model machine can stamp 3000 parts in 12 h.

    b. The new-model machine can stamp 5500 parts in 12 h.

    c. The two machines can stamp 8500 parts altogether in 12 h.

    d. It took 2 hours for the two machines to stamp 1500 parts altogether.

MATHEMATICS 8

FINAL TEST

GENERAL INSTRUCTIONS

1. Time: **2 hours**
2. Total Marks: **100**
3. This test is to be completed independently under supervision without the use of any resource materials.
4. Before you begin to write this test, read through the entire test quickly so you know what you are required to do. You have two hours to complete the test, so distribute your time accordingly.
5. The Mathematics 8 test consists of three parts:

   Part 1 – Multiple-Choice Questions

   Part 2 – Short-Answer Questions

   Part 3 – Problems

   As you do the questions in Part 1, you must **not** use a calculator. As you do the questions in Part 2 and Part 3, you may use a calculator, but BE SURE TO SHOW ALL YOUR WORK. Answers alone are not enough to get full marks.

Value

38

PART 1: MULTIPLE-CHOICE QUESTIONS

Suggested time: 25 minutes

Directions: Each of the following questions has four suggested answers, one of which is better than the others. Select the best answer, and indicate your choice by writing the letter in the blank on the response page at the right.

1. Which pair of numbers has 72 as the least common multiple?

   A. 24 and 36
   B. 6 and 24
   C. 9 and 12
   D. 24 and 16

2. Which pair of numbers has 6 as the greatest common factor?

   A. 16 and 60
   B. 24 and 36
   C. 18 and 24
   D. 21 and 30

3. Which is the greatest?

   A. 3^5
   B. 5^3
   C. 4^4
   D. 2^7

4. Which shows 2 500 000 expressed in scientific notation?

   A. 25×10^5
   B. 2.5×10^6
   C. 2.5×10^7
   D. 0.25×10^7

PART 1: RESPONSE PAGE

1. _____
2. _____
3. _____
4. _____

Name of Student _____ Student I.D. # _____

Name of School _____ Date _____

Part 1 (continued)

5. Which is the additive inverse of $-2\frac{1}{3}$?

   A. $-\frac{3}{7}$

   B. $\frac{3}{7}$

   C. $\frac{7}{3}$

   D. $-\frac{7}{3}$

6. Which of these numbers is **not** a rational number?

   A. 0.38
   B. 0.333 333...
   C. 0.121 121 112...
   D. – 0.27

7. Which statement is true?

   A. $-\frac{5}{8} > -\frac{5}{11}$

   B. $\frac{1}{2} < -\frac{1}{3}$

   C. $\frac{9}{10} > -\frac{7}{10}$

   D. $\frac{2}{3} < \frac{5}{8}$

8. Which number is **not** equivalent to 325%?

   A. 0.325
   B. 3.25
   C. $\frac{325}{100}$
   D. $3\frac{1}{4}$

PART 1: RESPONSE PAGE (continued)

5. _____

6. _____

7. _____

8. _____

Name of Student _____ Student I.D. # _____

Name of School _____ Date _____

Part 1 (continued)

9. Which is the sum $\frac{1}{10} + \frac{3}{10}$ in lowest terms?

   A. $\frac{1}{5}$

   B. $\frac{2}{5}$

   C. $\frac{4}{10}$

   D. $\frac{4}{20}$

10. Which is the sum $(-8) + (-3)$?

    A. -11
    B. $+11$
    C. -5
    D. $+5$

11. Which is the difference $8 - 2\frac{3}{4}$?

    A. $10\frac{3}{4}$

    B. $6\frac{1}{4}$

    C. $5\frac{1}{4}$

    D. $6\frac{3}{4}$

12. Which is the difference $(-2) - (-8)$?

    A. -6
    B. $+6$
    C. -10
    D. $+10$

PART 1: RESPONSE PAGE (continued)

9. _____

10. _____

11. _____

12. _____

Name of Student _____ Student I.D. # _____

Name of School _____ Date _____

Part 1 (continued)

13. Which is the product $\frac{1}{2} \times \frac{4}{5}$ in lowest terms?

A. $\frac{5}{7}$

B. $1\frac{3}{10}$

C. $\frac{2}{5}$

D. $2\frac{1}{2}$

14. Which is the product $(-2) \times (-8)$?

A. -10
B. $+10$
C. -16
D. $+16$

15. Which is the quotient $\frac{15}{16} \div \frac{5}{8}$ in lowest terms?

A. $1\frac{1}{2}$

B. $\frac{75}{128}$

C. $1\frac{1}{4}$

D. $\frac{5}{6}$

16. Which expression shows 3 more than 5 times a number?

A. $3 + 5n$
B. $n + 3 \times 5$
C. $3n + 5$
D. $3 \times 5 + n$

17. Which equation shows 5 less than a number is 8?

A. $5 < n + 8$
B. $5 - n = 8$
C. $5 < 8$
D. $n - 5 = 8$

PART 1: RESPONSE PAGE (continued)

13. _____

14. _____

15. _____

16. _____

17. _____

Name of Student _____ Student I.D. # _____

Name of School _____ Date _____

Part 1 (continued)

18. What is the missing number?

n	▒ $n + 6$
1	8
2	10
3	12
4	14

A. 1
B. 2
C. 3
D. 4

19. What ordered pair solves the equation $y = 3x + 1$?

A. (1, 0)
B. (4, 1)
C. (1, 4)
D. (0, 1)

PART 1: RESPONSE PAGE (continued)

18. _____

19. _____

Name of Student _____ Student I.D. # _____

Name of School _____ Date _____

Value

PART 2: SHORT-ANSWER QUESTIONS

Suggested time: 15 minutes

Directions: When answering the following questions, show all necessary work and give complete answers on the response page at the right.

8

1. Solve each of the following equations using additive inverses and/or multiplicative inverses.

   a. $x + 16 = 20$

   b. $5n = 35$

   c. $8t - 2t = 36$

   d. $14 + 4x = 66$

PART 2: RESPONSE PAGE

1. a.

b.

c.

d.

Name of Student _____ Student I.D. # _____

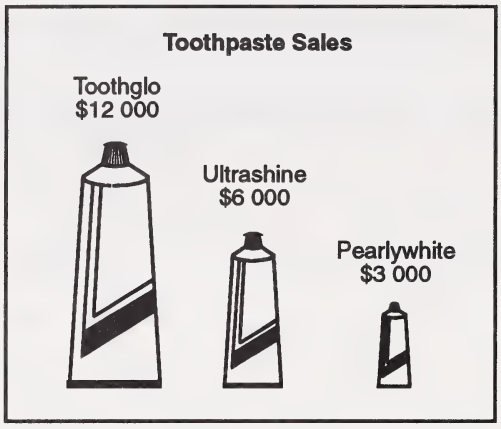
Name of School _____ Date _____

Part 2 (continued)

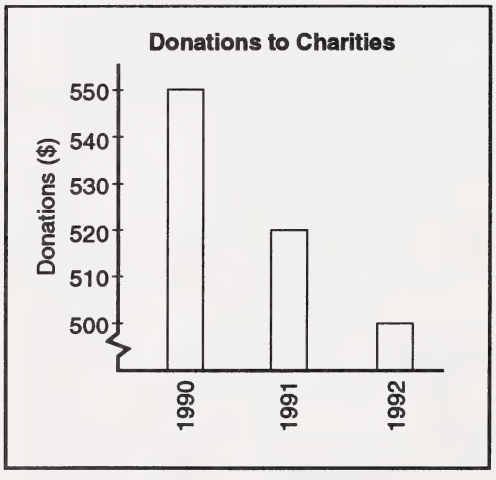
4

2. Why are the following graphs misleading?

a.



b.



PART 2: RESPONSE PAGE (continued)

2. a.

b.

Name of Student _____ Student I.D. # _____

Name of School _____ Date _____

Value

PART 3: PROBLEMS

Suggested Time: 80 minutes

Directions: When answering the following questions, show all necessary work and give complete answers on the response page at the right.

2 1. Crystal swam $5\frac{1}{3}$ lengths of the pool. If she did the crawl for $\frac{3}{4}$ of the time, how many lengths did she do the crawl?

2 2. Each plastic flight on a dart is in the shape of a parallelogram. The base of one flight is 3.2 cm and its height is 1.7 cm. Find the area of the flight.

2 3. A football team makes a gain of 5 yards, 12 yards, and 3 yards. It suffers losses of 10 yards and 4 yards. What is the total gain or loss in yards for the team?

2 4. On a hot day, an apple tree may lose 4.5 L of water per minute. Calculate the amount of water loss in one hour on a hot day.

2 5. The largest indoor rink is a rectangle that measures 75.2 m by 107.3 m. What is its area?

2 6. Chan knits one row of her scarf in $\frac{1}{20}$ h. How many rows can she knit in $\frac{3}{4}$ h?

PART 3: RESPONSE PAGE (continued)

1.

2.

3.

4.

5.

6.

Name of Student _____ Student I.D. # _____

Name of School _____ Date _____

Part 3 (continued)

2 7. A jacket regularly priced at $90 is on sale. If the discount is 25%, what is the sale price?

2 8. A discus has a radius of 11 cm. What is the area of the discus?

2 9. On Saturday it snowed for $3\frac{1}{2}$ h. On Sunday it snowed for $1\frac{3}{4}$ h. How much longer did it snow on Saturday than on Sunday?

2 10. The temperature in Claresholm was – 8° C in the morning. By noon the temperature rose to 7° C. What was the change in temperature?

2 11. The dorsal fin of a shark is shaped like a triangle. It is 15.4 cm wide at the base and 22.3 cm high. Find the area of the dorsal fin.

2 12. Samir used $2\frac{1}{8}$ cans of paint. Fatima used $1\frac{3}{4}$ cans of paint. How many cans did they use altogether?

2 13. There are about 750 million people in China. The most common family name in China is Chang. People with a family name of Chang make up about 10% of the Chinese population. How many people in China have the family name Chang?

PART 3: RESPONSE PAGE (continued)

7.

8.

9.

10.

11.

12.

13.

Name of Student _____ Student I.D. # _____

Name of School _____ Date _____

Part 3 (continued)

2 14. A rectangular block of wood has dimensions of 12 m by 1.25 m by 0.75 m. Calculate the volume of the wood.

2 15. In a survey 32 students out of 100 preferred country and western music. Estimate how many students in the student body of 372 prefer country and western music.

4 16. Dave shares a package of candies with Patty, Lori, and Suzanne. He gives $\frac{1}{5}$ of the candies to Patty. He then gives $\frac{1}{4}$ of the remaining candies to Lori. Next, he gives $\frac{1}{3}$ of the remaining candies to Suzanne. He keeps the rest of the candies for himself.

a. What fraction of the candies does each person have?

b. Who has the most candies?

4 17. Krish and Jean share the profits from their yard sale. The ratio of Krish's profits to Jean's profits is 5 to 3. If there is $160 in profits, how much does Krish make?

4 18. A goat is tied with a rope in one corner of a fenced field. The field is a square and the rope has the same length as one side of the field. If the perimeter of the field is 140 m, what is the area of the part of the field in which the goat can graze?

PART 3: RESPONSE PAGE (continued)

14.

15.

16. a.

b.

17.

18.

Name of Student _____ Student I.D. # _____

Name of School _____ Date _____

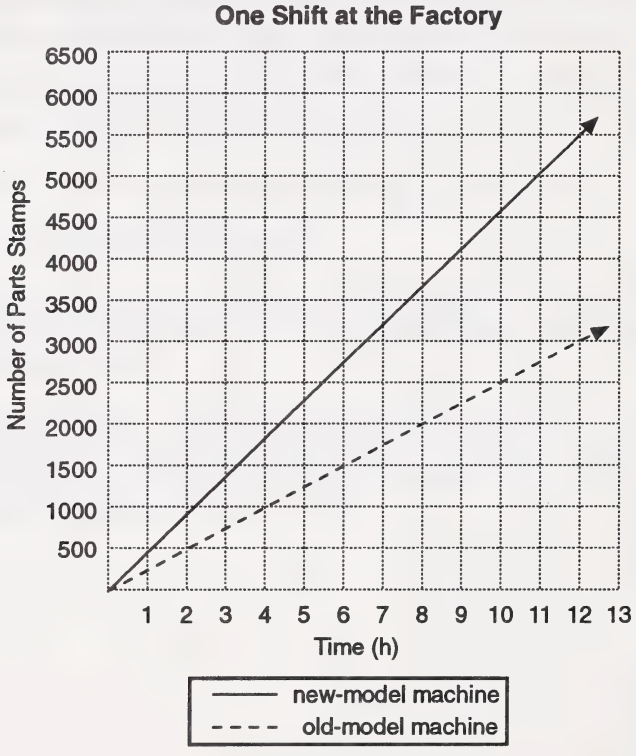
Part 3 (continued)

4

19. There are less than a dozen round tables at a banquet. The round tables are two sizes. One size seats exactly 5 people and the other size seats exactly 8 people. If there are 79 people seated at the round tables and there are no empty places, how many tables of each size are there?

4

20. A factory has two models of machines to stamp parts. This graph shows how many parts each machine can stamp in one 12-h shift.



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d. How long did it take the new-model machine and the old-model machine to stamp 1500 parts altogether?

PART 3: RESPONSE PAGE (continued)

19.

20. a.

b.

c.

d.

Name of Student _____ Student I.D. # _____

Name of School _____ Date _____

This is a course designed in a new distance-learning format, so we are interested in your responses. Your constructive comments will be greatly appreciated so that a future revision may incorporate any necessary improvements.

TEACHER QUESTIONNAIRE FOR MATHEMATICS 8

Teacher's Name _____ Area of Expertise _____

School Name _____ Date _____

Design

1. The modules follow a definite systematic design. Did you find it easy to follow?

   ❑ Yes ❑ No If no, explain.

   _____

   _____

2. Did your observations reveal that the students found the design easy to follow?

   ❑ Yes ❑ No If no, explain.

   _____

   _____

3. Did you find the Learning Facilitator's Manual helpful?

   ❑ Yes ❑ No If no, explain.

   _____

   _____

4. Part of the design involves stating the objectives in student terms. Do you feel this helped the students understand what they were going to learn?

   ❑ Yes ❑ No If no, explain.

   _____

   _____

5. The questions in the Module Booklet are to help clarify and reinforce the instructional materials. The answers were placed in the Learning Facilitator's Manual. Did this design prove helpful?

❑ Yes ❑ No If no, explain.

_____

_____

6. Did the Extra Practice prove to be helpful?

❑ Yes ❑ No If no, explain.

_____

_____

7. Were students motivated to try the Extra Practice?

❑ Yes ❑ No If no, give details.

_____

_____

8. Suggestions for computer and video activities are included in the course. Were your students able to use these activities?

❑ Yes ❑ No Comment on the lines below.

_____

_____

9. Were the assignments appropriate?

❑ Yes ❑ No If no, give details.

_____

_____

10. Did you fax assignments?

❑ Yes ❑ No

11. If you did fax, did you get satisfactory results from using this procedure?

❑ Yes ❑ No If no, give details.

_____

_____

Instruction

1. Did you find the instruction clear?

❑ Yes ❑ No If no, give details.

_____

_____

2. Did your observations reveal that the students found the instruction interesting?

❑ Yes ❑ No If no, give details.

_____

_____

3. Did you find the instruction adequate?

❑ Yes ❑ No If no, give details.

_____

_____

4. Was the reading level appropriate?

❑ Yes ❑ No If no, give details.

_____

_____

5. Was the workload adequate?

❑ Yes ❑ No If no, give details.

_____

_____

6. Was the content accurate and current?

❑ Yes ❑ No If no, give details.

_____

_____

7. Did the content flow consistently and logically?

❑ Yes ❑ No If no, give details.

_____

_____

8 Was the transition between booklets smooth?

❑ Yes ❑ No If no, give details.

_____

_____

9. Was the transition between print and media smooth?

❑ Yes ❑ No If no, give details.

_____

_____

Additional Comments

_____

_____

_____

_____

_____

_____

When you have completed this questionnaire, please mail it to the following address:

Design Department
Alberta Distance Learning Centre
Box 4000
Barrhead, Alberta
T0G 2P0

MATH 8

9MA08T17

L.R.D.C.
Producer

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1992